

MANAGING DROUGHT

IN THE SOUTHERN PLAINS

October 27, 2011

Webinar Series Goals

- To improve communication among agencies and organizations in the Southern Plains who are being affected by the historic and exceptional drought
- To provide information on available resources and assistance to help monitor and manage drought
- To understand the impacts of drought in this region from the perspective of those who are tasked with managing it
- To document impacts that will help improve the weekly U.S. Drought Monitor assessment and our understanding of how drought impacts evolve and decay

Webinar Format

- 2nd and 4th Thursdays of each month at 11:00 a.m. Central Time
- Overview of regional drought conditions and outlook for next several weeks to months
 - led by the Drought Monitor authors
- Discussion Topic
 - Alternating between an impact type (wildfire, agriculture) and a resource (monitoring tools, assistance programs)
- Comments & Updates from State Climatologists
- Open-ended time for questions and comments
- Total Time Commitment: 25 minutes for presentations, as much time as needed for discussion
- Past webinars, summaries, and Federal/State Assistance links posted on the U.S. Drought Monitor, <http://www.drought.gov> in the Southern Plains Region or directly at http://www.drought.gov/portal/server.pt/community/southern_plains

Regional Drought Monitor Update

Brian Fuchs, Climatologist

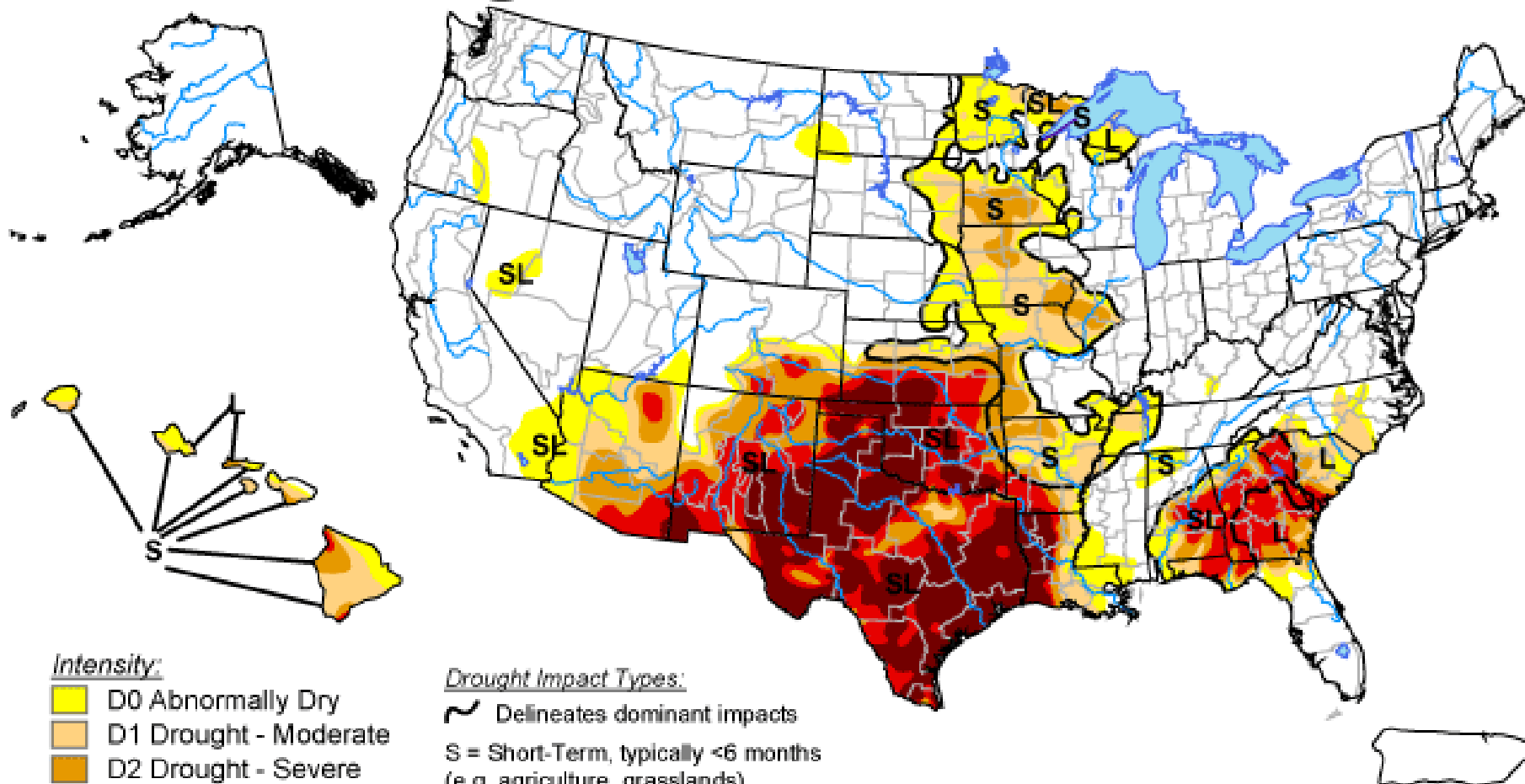
**National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln**

SCIPP/NIDIS Drought Webinar Series, October 27, 2011

U.S. Drought Monitor

October 25, 2011

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- Delineates dominant impacts
- S = Short-Term, typically <6 months
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months
(e.g. hydrology, ecology)

*The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.*

<http://droughtmonitor.unl.edu/>



Released Thursday, October 27, 2011

Author: David Miskus, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

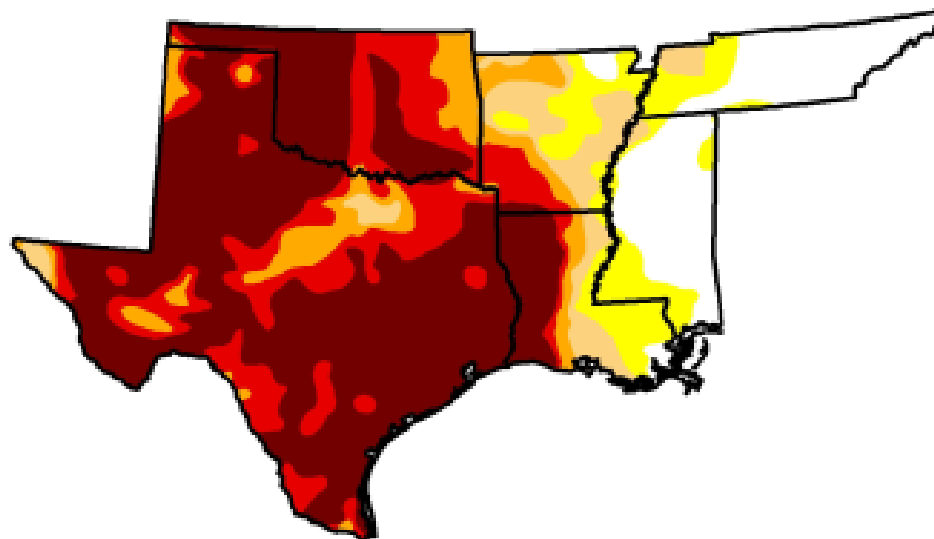
South

October 25, 2011

Valid 7 a.m. EST

Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|-------|-------|-------|-------|-------|-------|
| Current | 13.04 | 86.96 | 77.92 | 70.89 | 62.67 | 45.84 |
| Last Week (10/18/2011 map) | 14.13 | 85.87 | 78.18 | 71.28 | 63.72 | 47.94 |
| 3 Months Ago (07/26/2011 map) | 9.44 | 90.56 | 85.25 | 73.95 | 63.56 | 47.93 |
| Start of Calendar Year (12/28/2010 map) | 8.86 | 91.14 | 67.65 | 35.21 | 10.17 | 0.00 |
| Start of Water Year (09/27/2011 map) | 18.34 | 81.66 | 76.26 | 70.61 | 63.67 | 53.77 |
| One Year Ago (10/19/2010 map) | 38.03 | 61.97 | 33.77 | 16.66 | 4.17 | 0.00 |

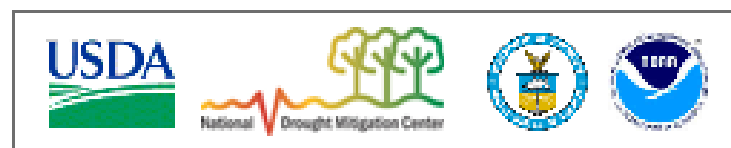


Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, October 27, 2011
David Miskus, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

West

October 25, 2011

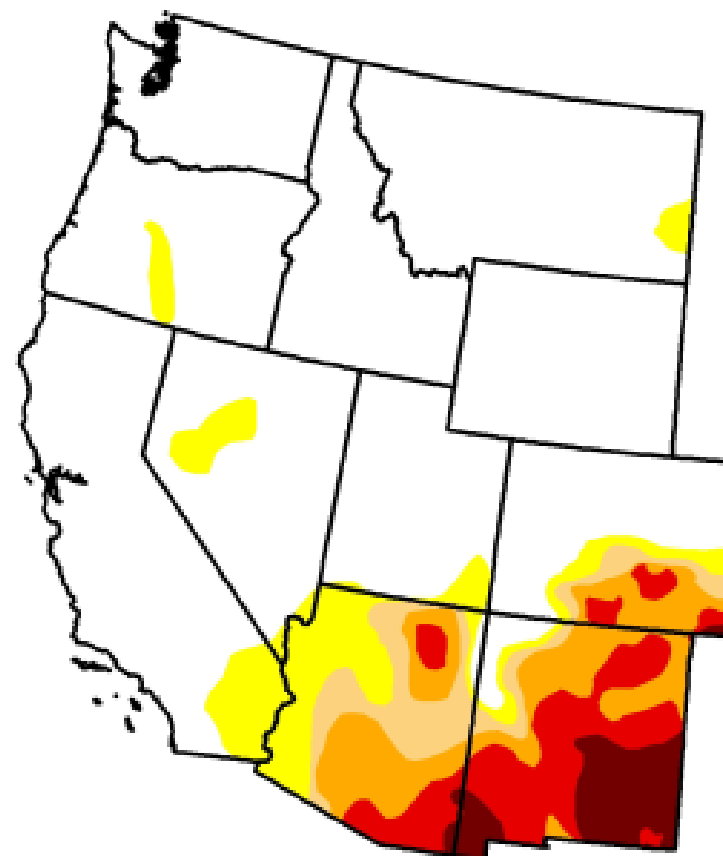
Valid 7 a.m. EST

Drought Conditions (Percent Area)

| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|-------|-------|-------|-------|-------|------|
| Current | 74.12 | 25.88 | 18.32 | 14.67 | 8.48 | 2.87 |
| Last Week (10/18/2011 map) | 74.71 | 25.29 | 18.32 | 14.67 | 8.48 | 2.87 |
| 3 Months Ago (07/26/2011 map) | 74.71 | 25.29 | 19.01 | 15.46 | 11.11 | 5.55 |
| Start of Calendar Year (12/28/2010 map) | 73.26 | 26.74 | 11.98 | 0.89 | 0.00 | 0.00 |
| Start of Water Year (09/27/2011 map) | 66.72 | 33.28 | 19.04 | 14.99 | 9.30 | 3.81 |
| One Year Ago (10/19/2010 map) | 62.30 | 37.70 | 6.01 | 0.56 | 0.00 | 0.00 |

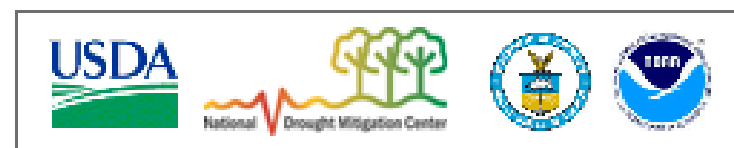
Intensity:

| | |
|---|--|
|  D0 Abnormally Dry |  D3 Drought - Extreme |
|  D1 Drought - Moderate |  D4 Drought - Exceptional |
|  D2 Drought - Severe | |



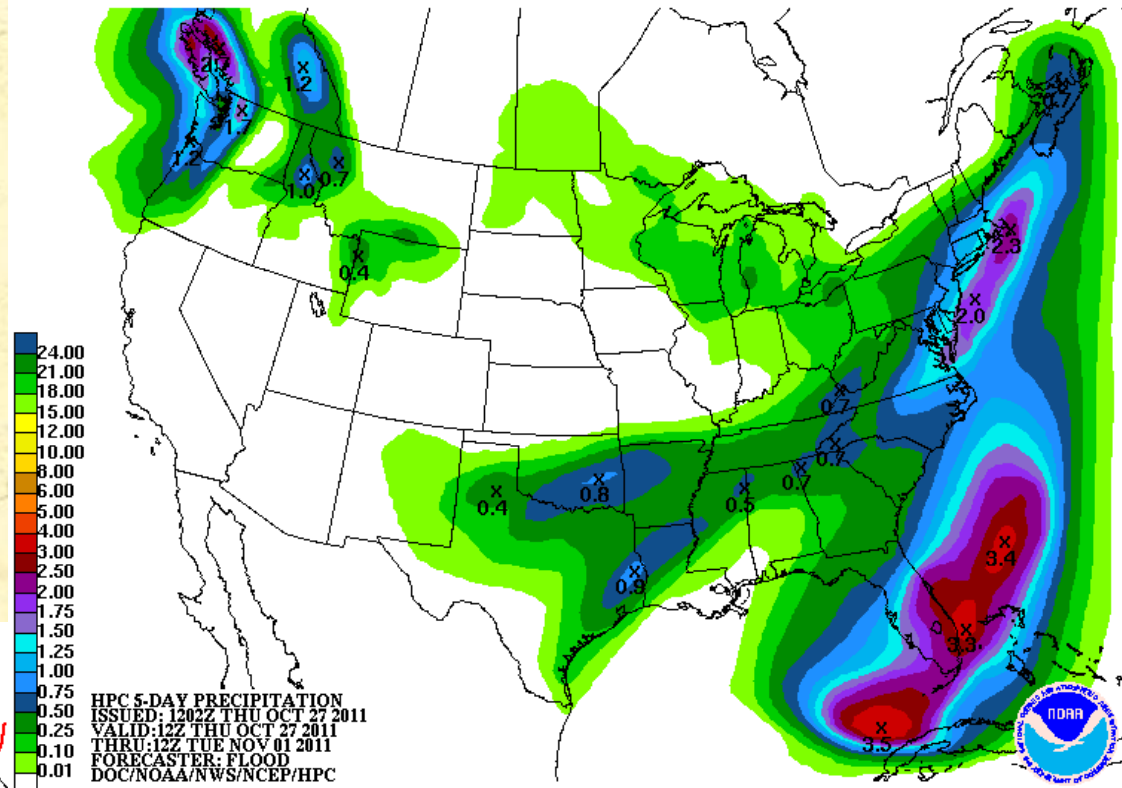
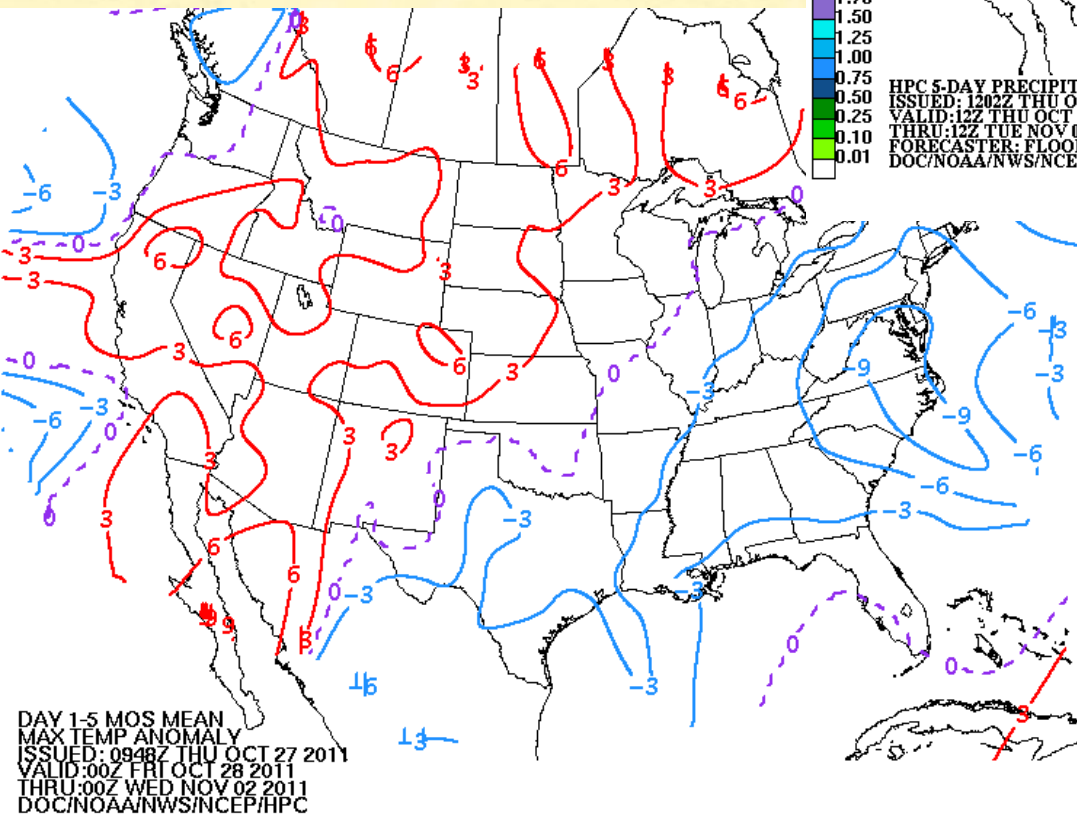
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>

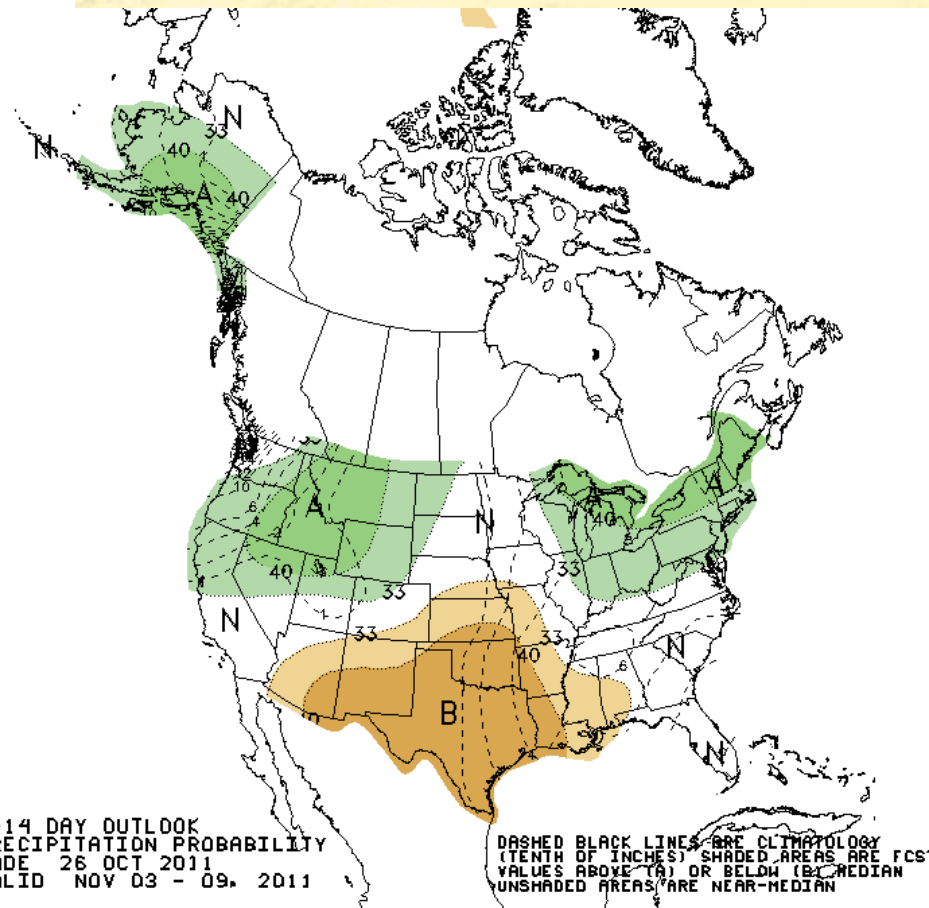
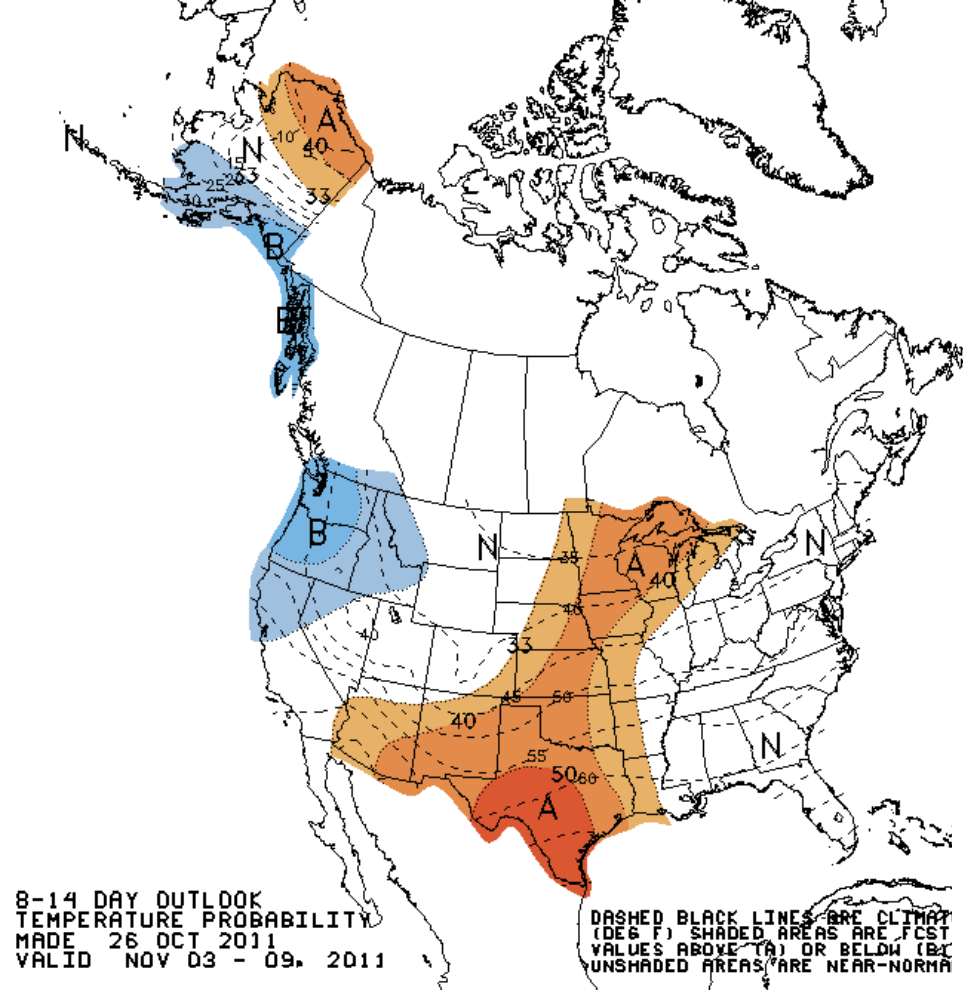


Released Thursday, October 27, 2011
David Miskus, NOAA/NWS/NCEP/CPC

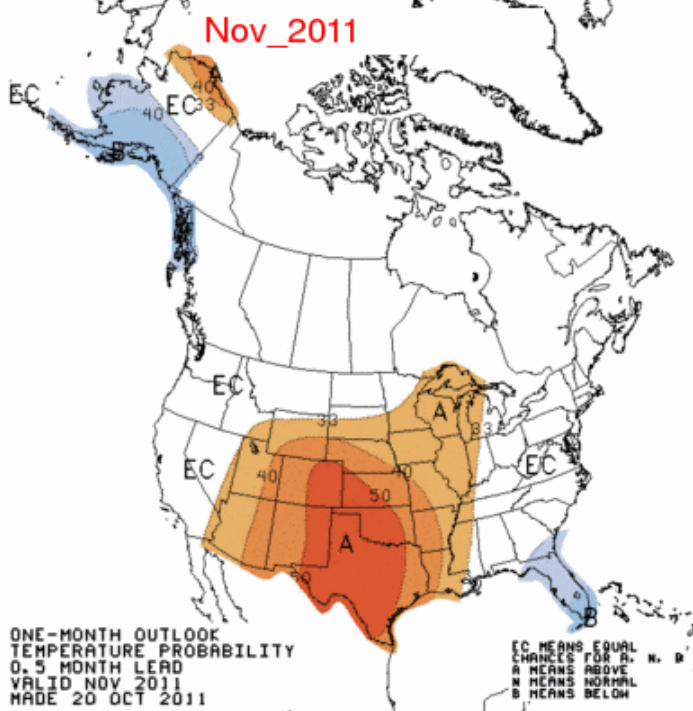
HPC 5-Day Outlook



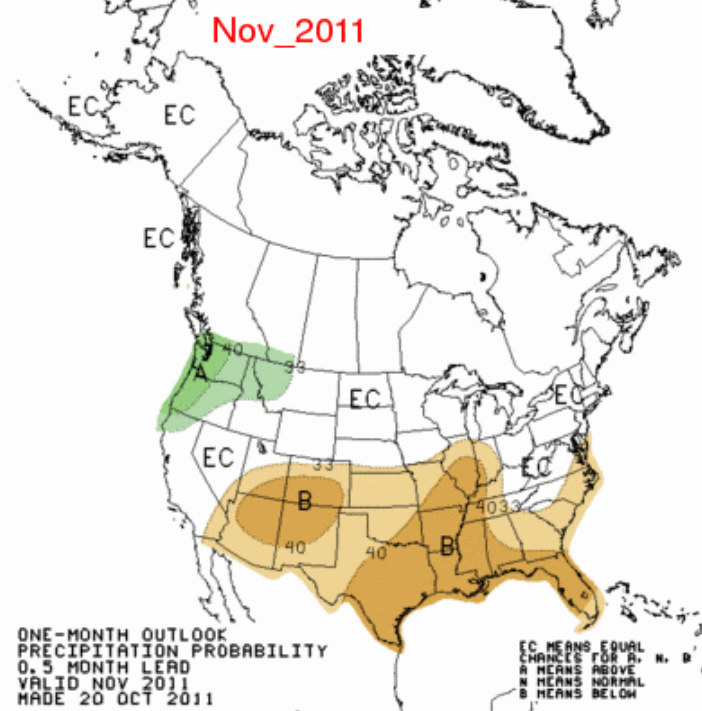
CPC 8-14-Day Outlooks



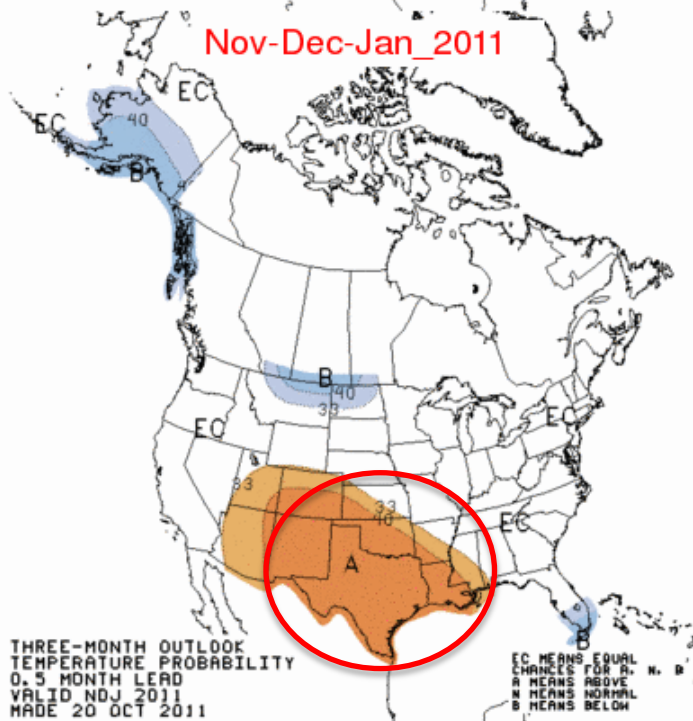
Nov_2011



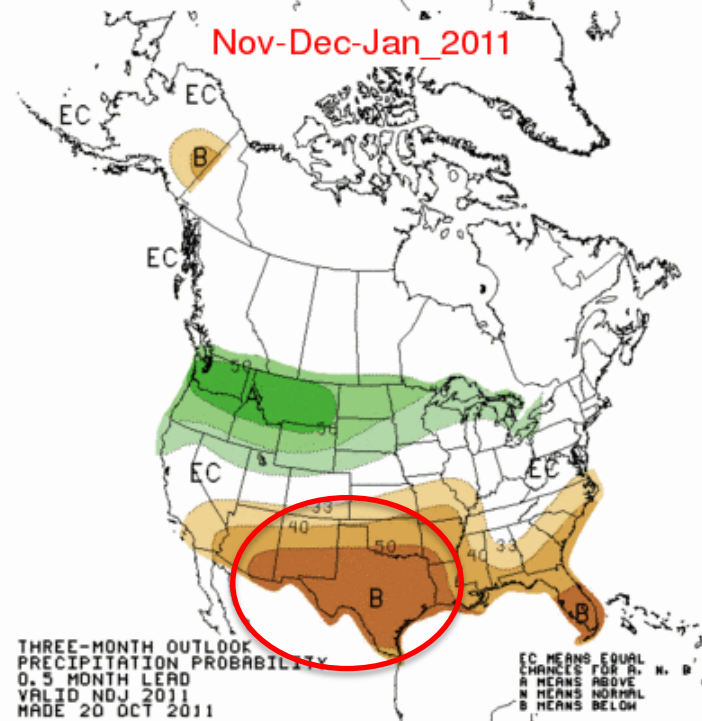
Nov_2011



Nov-Dec-Jan_2011



Nov-Dec-Jan_2011



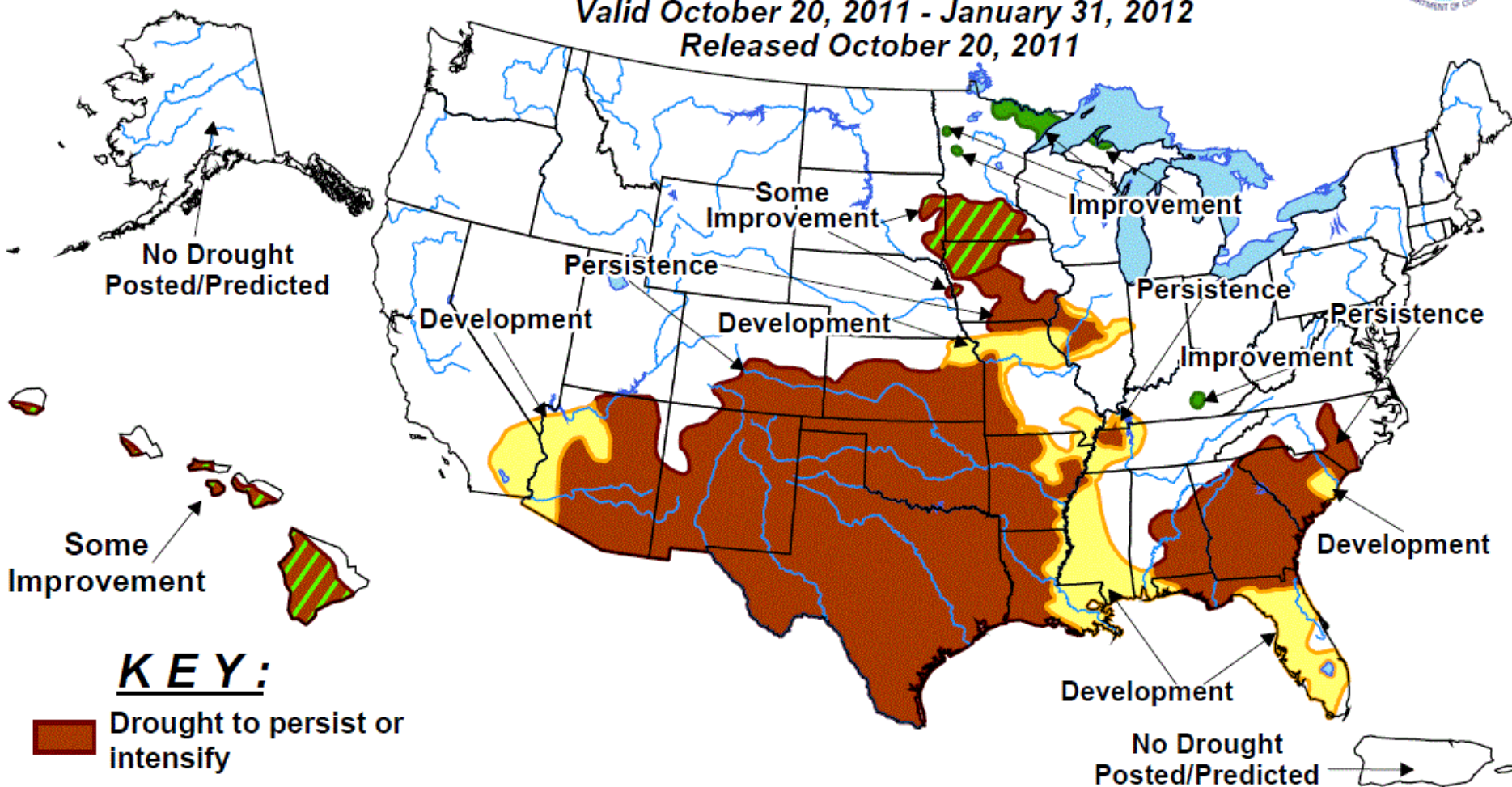


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid October 20, 2011 - January 31, 2012

Released October 20, 2011



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Featured USDM Product

Did you know.....

There are more monitoring tools being made available using gridded data and provided using the USDM percentiles?

NLDAS

<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>

U. Of Washington

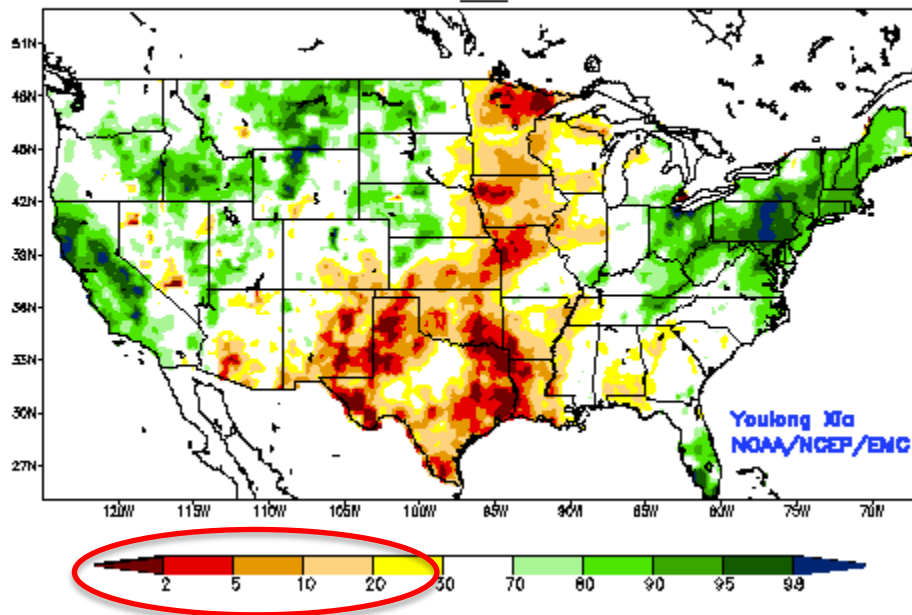
<http://www.hydro.washington.edu/forecast/monitor/index.shtml>

Texas SC Office

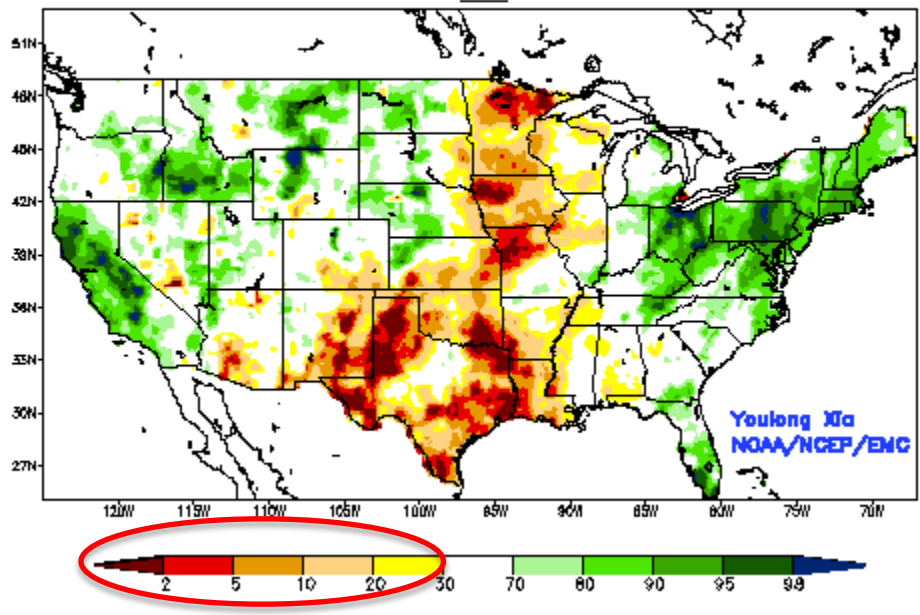
<http://atmo.tamu.edu/osc/drought/>

NLDAS soil moisture products use modeled and in situ inputs

Ensemble-Mean - Current Total Column Soil Moisture Percentile
NCEP NLDAS Products Valid: OCT 20, 2011



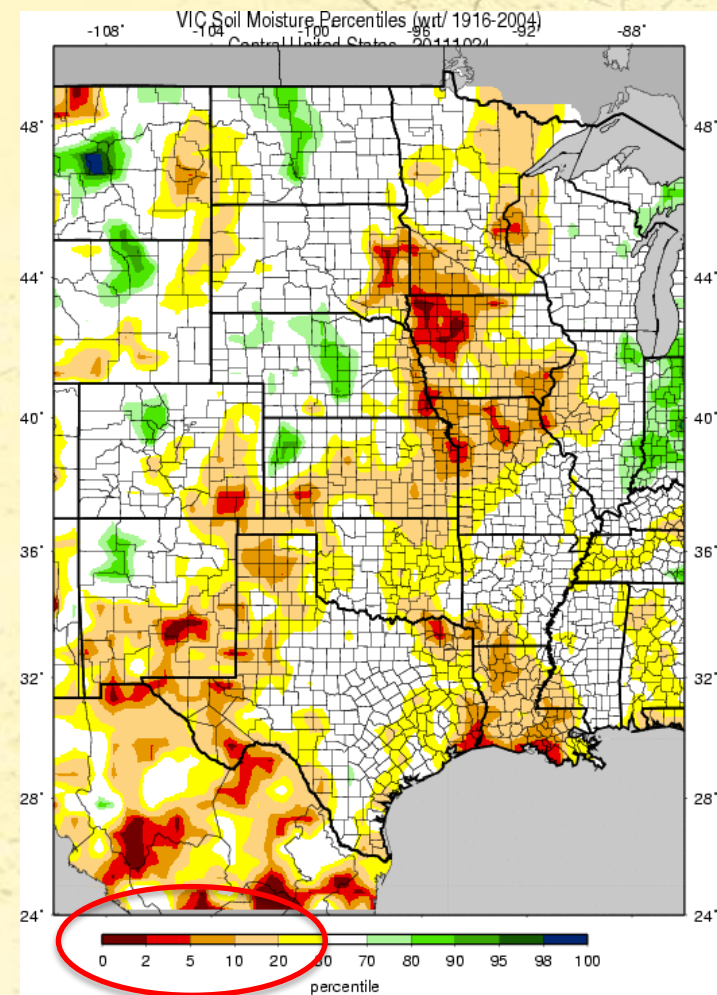
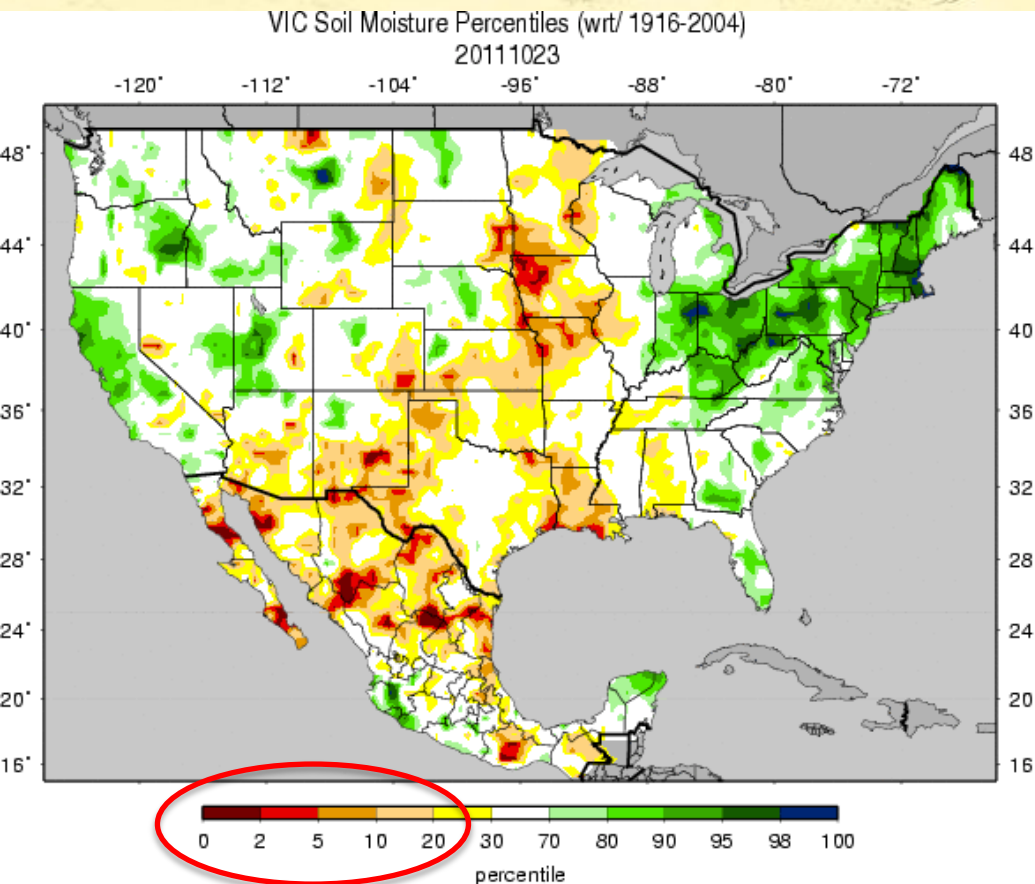
Ensemble-Mean - Current Top 1M Soil Moisture Percentile
NCEP NLDAS Products Valid: OCT 20, 2011



USDM Percentiles

<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>

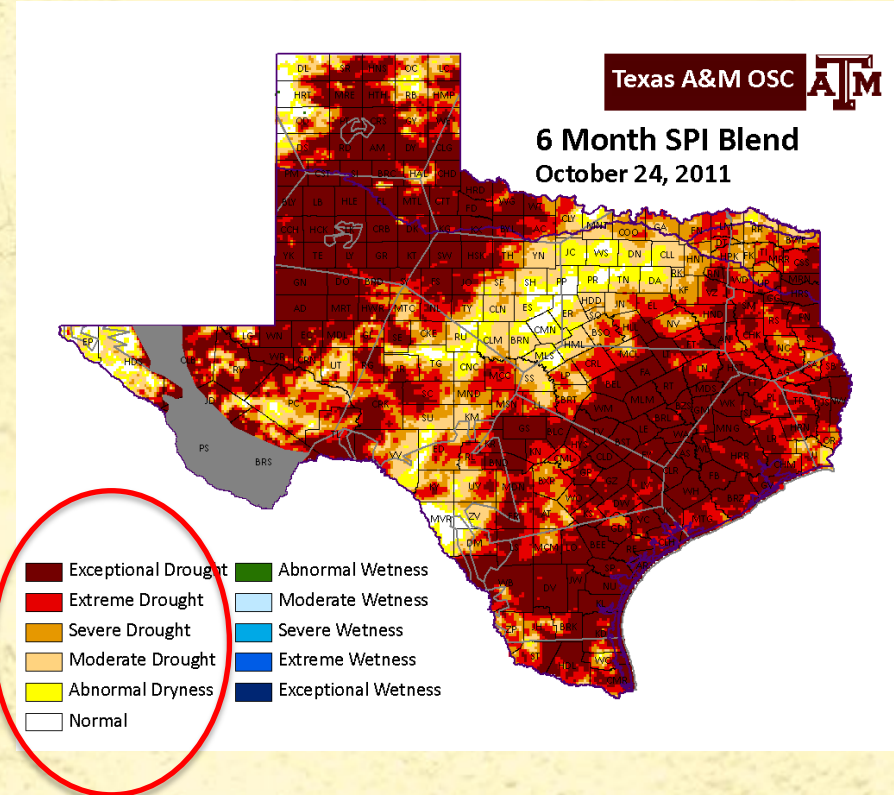
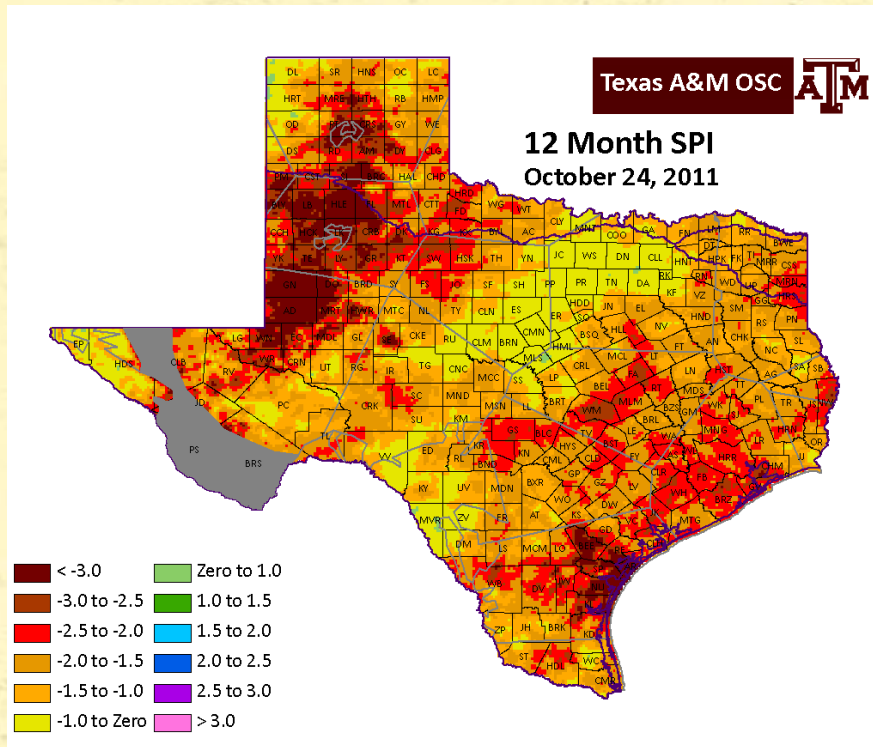
University of Washington VIC Soil Moisture Products



USDM Percentiles

<http://www.hydro.washington.edu/forecast/monitor/index.shtml>

Texas State Climate Office 4km gridded SPI products use radar derived precipitation data



USDM Intensity Levels

Drought in a “Flash”: Just What is Flash Drought?

**Mark Svoboda, Climatologist
Monitoring Program Area Leader**

**National Drought Mitigation Center
School of Natural Resources
University of Nebraska-Lincoln**

What is Flash Drought?

- Real estate = location, location, location
- Drought = timing, timing, timing
 - ET varies regionally and seasonally
 - Onset timing critical w/ phenological stage
- Preceding conditions are very important!
- Magnitude = Intensity x Duration
- Drought exacerbates the ET effect
 - Relatively less cloud cover (associated w/ persistent High pressure systems) = more sunshine
 - Typically more wind
 - Can also be associated with heat waves

What is Flash Drought?

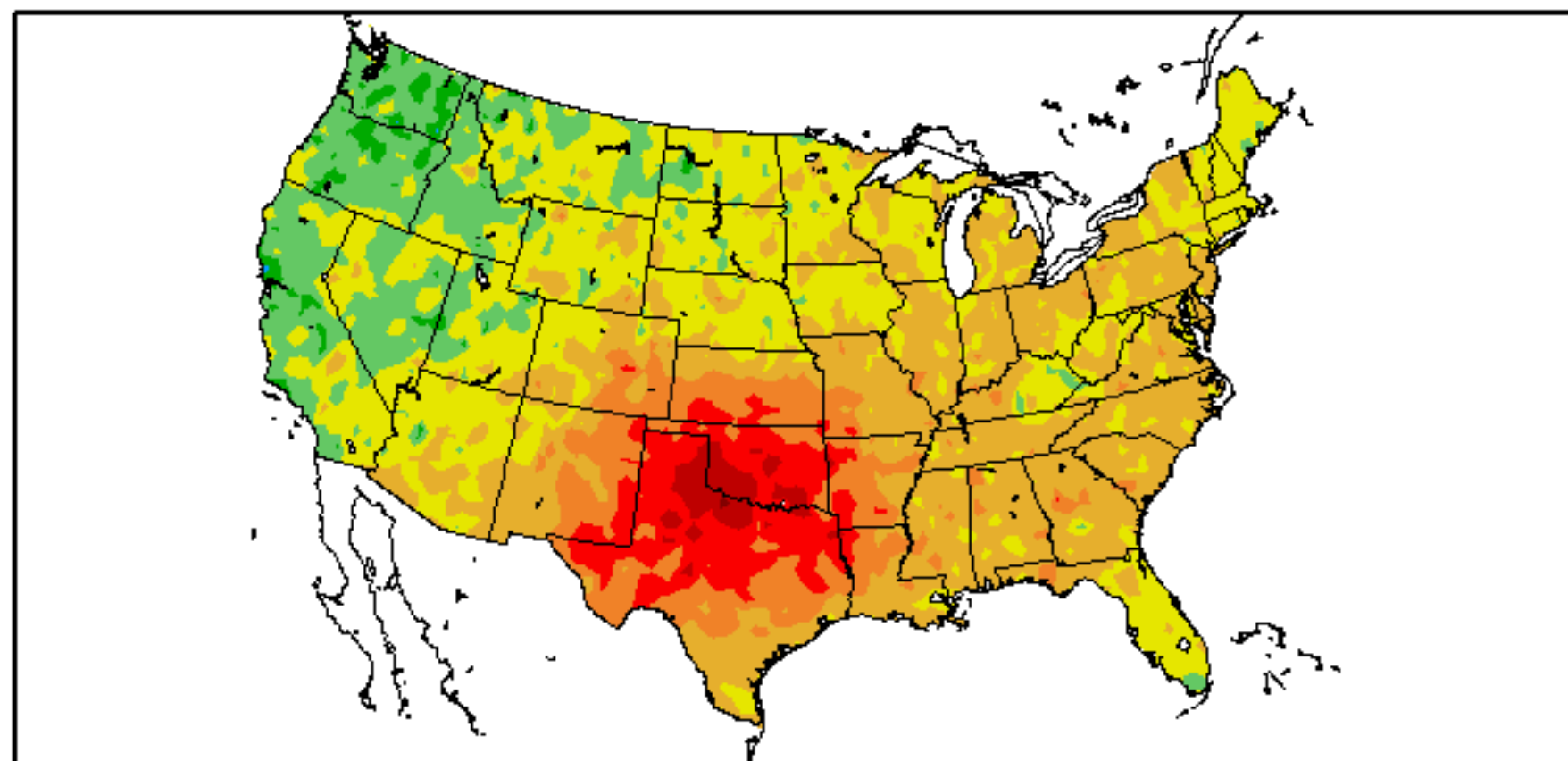
- Typically below normal RH = enhanced fire risk
- This all adds up to an increased draw on soil moisture reserves, which equals less transpiration (vegetation shutting down or dying....depending on root system depth) and from open water bodies, soil and snow via evaporation.....
- High night time minimums are also stressful on livestock and crops

What is Flash Drought?

- Loosely defined, one could say ***“flash drought” is a relatively rapid (weeks instead of months or seasons) onset extreme event (and often short lived) coupling precipitation deficits with intense heat and winds that occur during a critical phenological stage in the growing season often impacting natural vegetation, crops, livestock and can also bring about increased wildfire outbreaks.***
- Illustrates the need for a new breed of indicators in a comprehensive DEWS (Drought Early Warning System)

Departure from Normal Temperature (F)

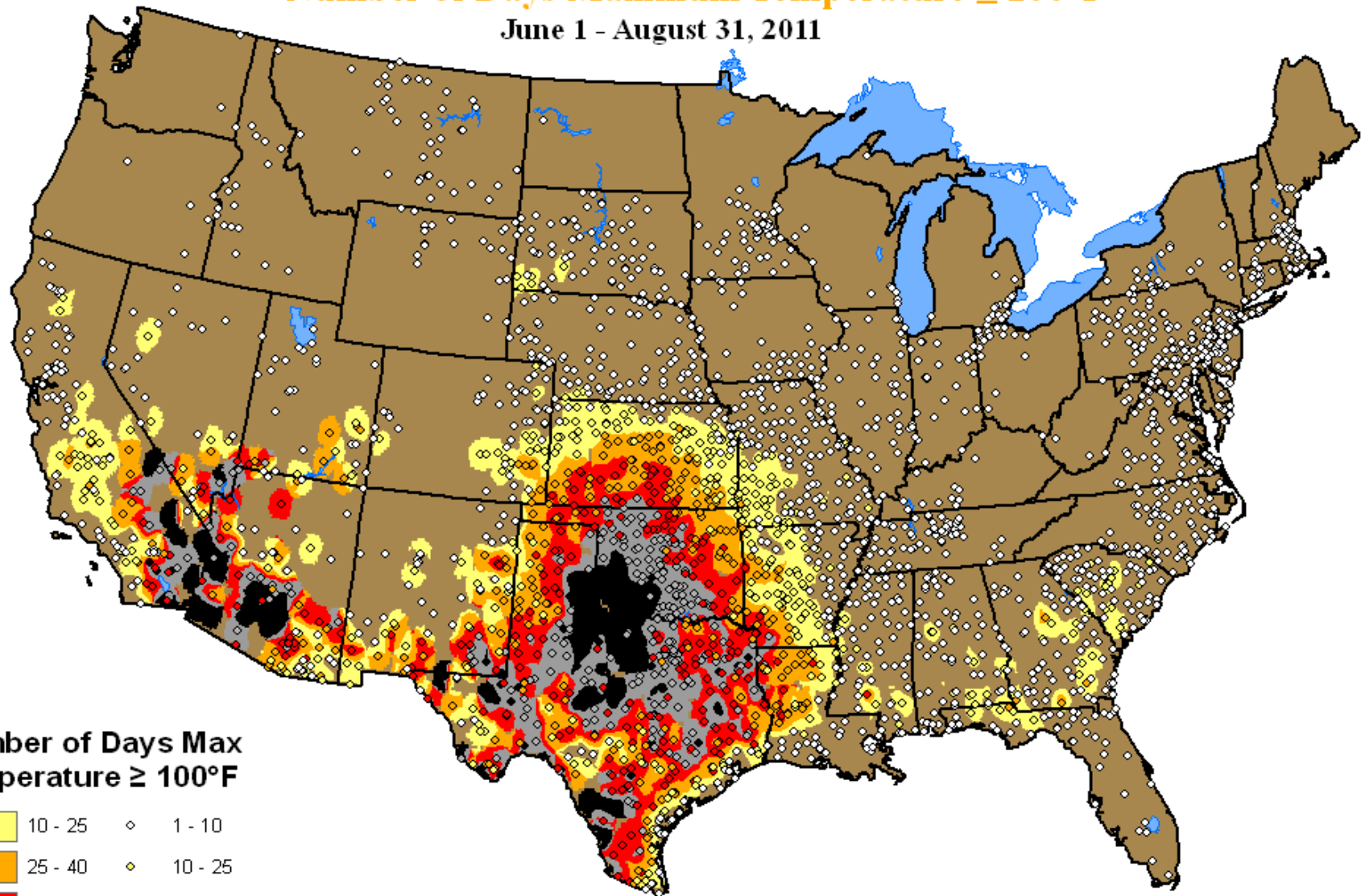
6/1/2011 – 8/31/2011



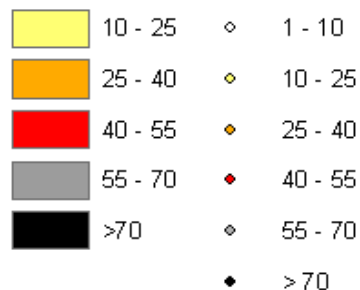
Persistent Heat Engulfs Nation - Summer 2011

Number of Days Maximum Temperature $\geq 100^{\circ}\text{F}$

June 1 - August 31, 2011



Number of Days Max
Temperature $\geq 100^{\circ}\text{F}$



Total number of stations: 2731 (only includes 60 or more non-missing days).

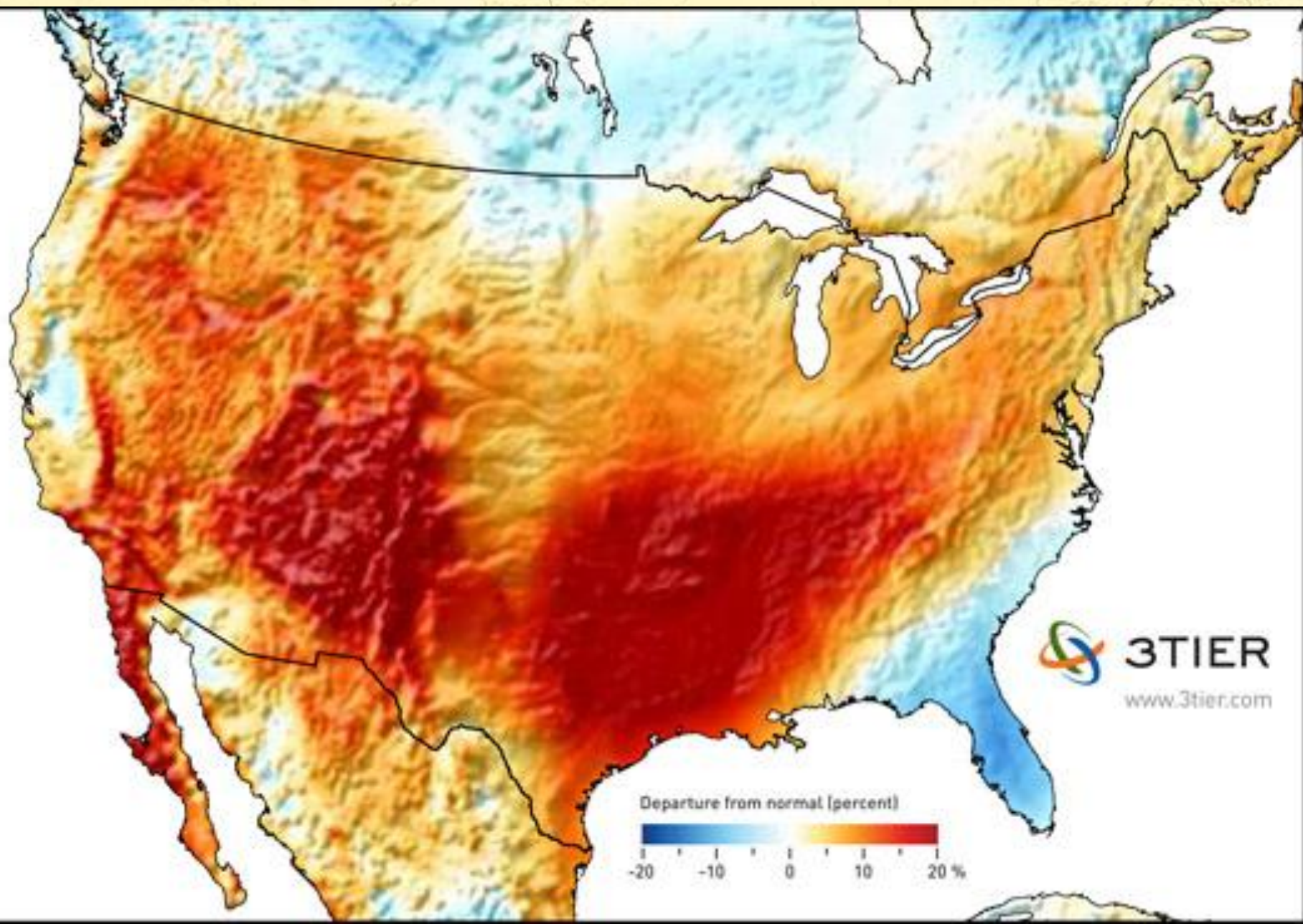
Leader: Laredo AP TX 90 out of 92 possible days.

Preliminary data: full quality assurance not yet applied.

Updated: September 27, 2011



NOAA's
National Climatic Data Center





A Satellite-based Drought Product using Thermal Remote Sensing of Evapotranspiration

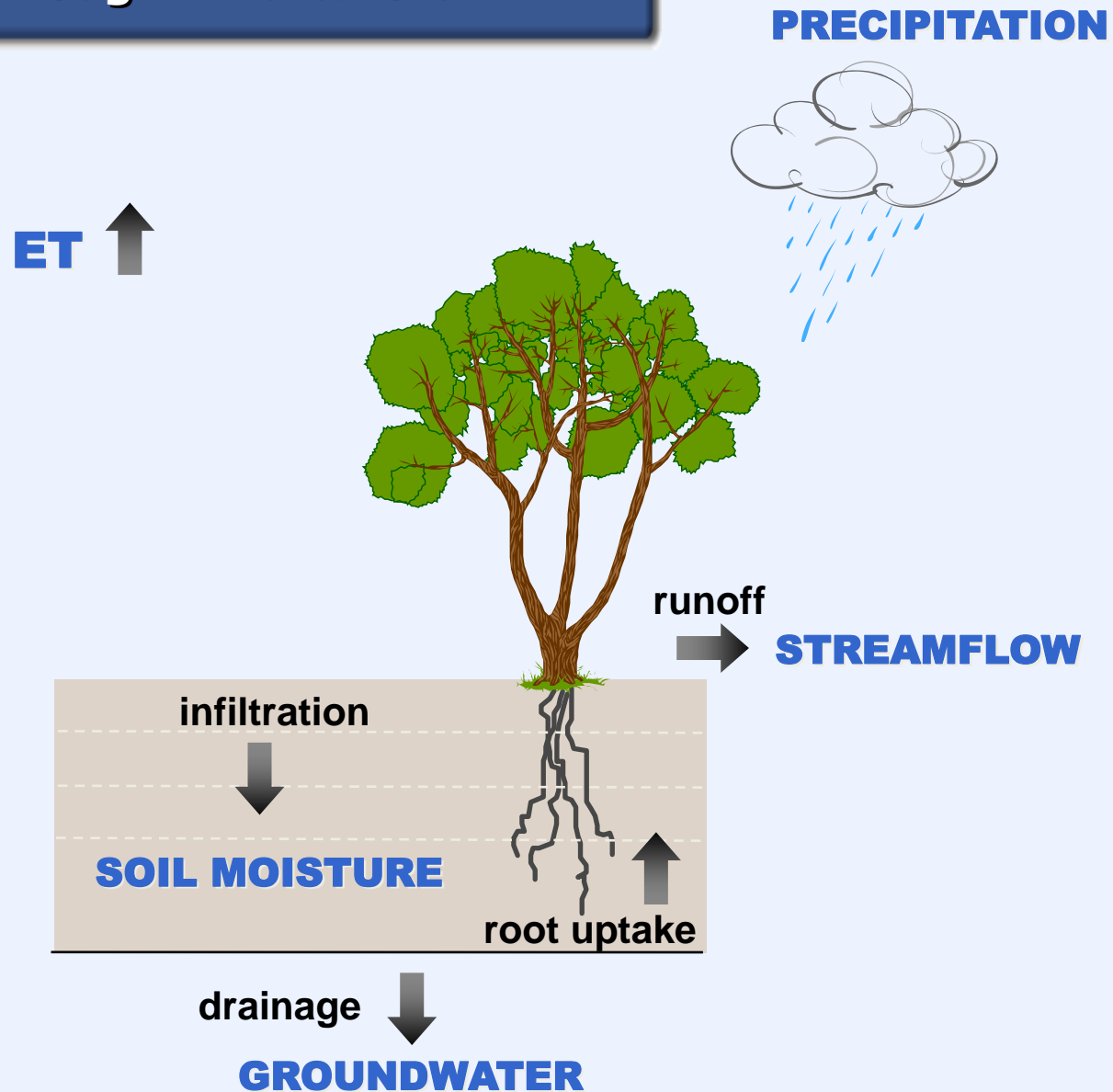
M.C. Anderson, W.P. Kustas

*USDA-ARS, Hydrology and Remote Sensing
Laboratory*

C. Hain, X. Zhan

NOAA - NESDIS

Hydro Drought Indicators



ET Driving Factors

NET RADIATION



ET



VPD, TEMP



WIND

e_{air}
 R_A

T

R_X

R_s

VEGETATION
CONDITION

e_{sat}
 R_{canopy}

R_{soil}

E

e_{soil}

infiltration

SOIL MOISTURE

root uptake

drainage

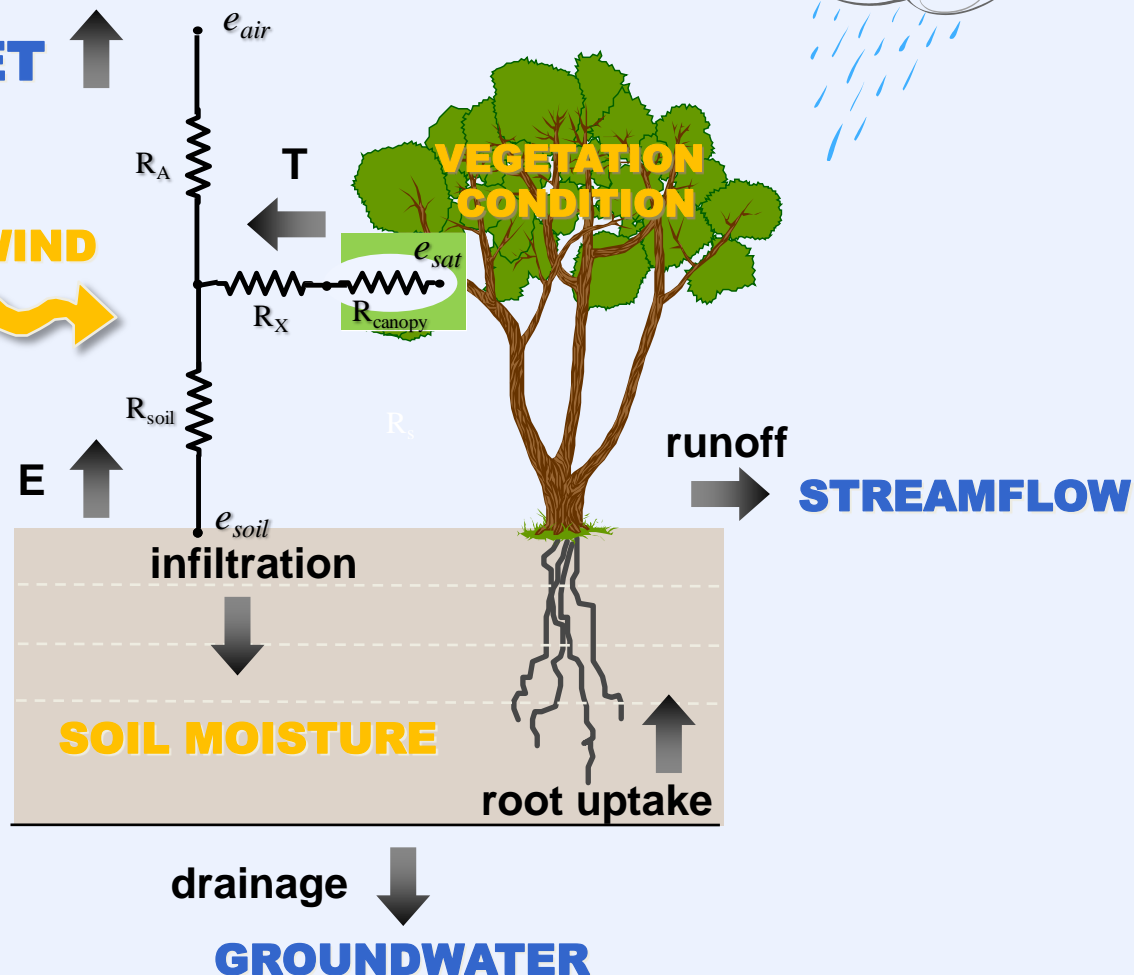
GROUNDWATER

PRECIPITATION



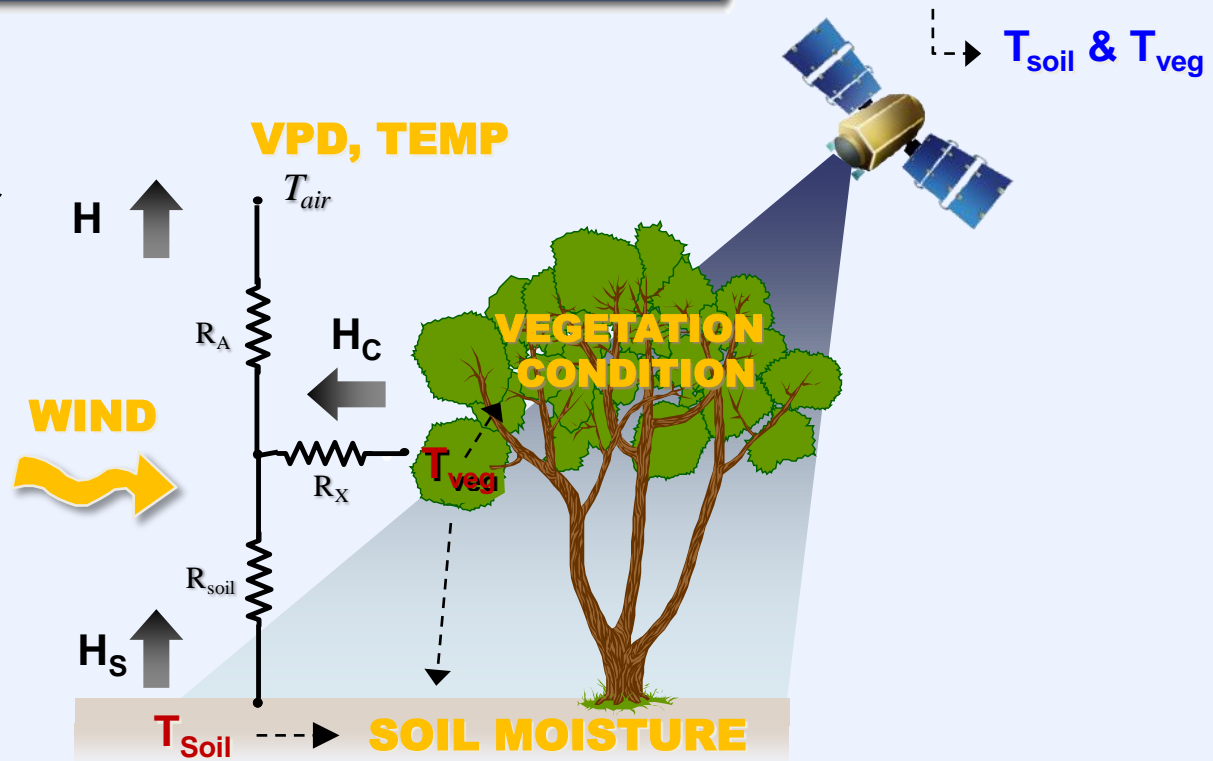
runoff

STREAMFLOW



Remotely sensed ET

NET RADIATION

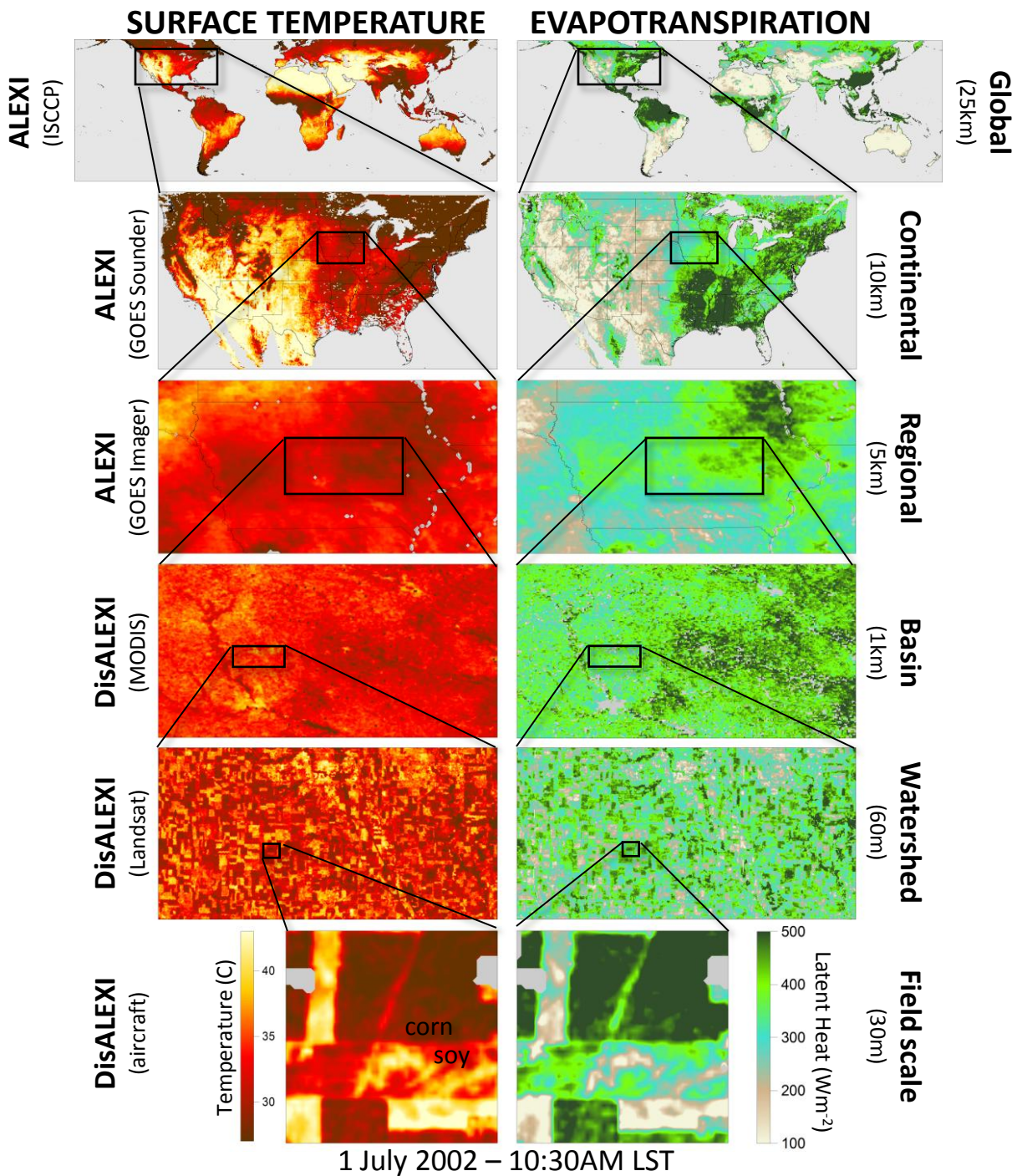


SURFACE TEMPERATURE

ET computed as a residual to the surface energy balance:

$$ET = RN - G - H$$

$\underbrace{\hspace{10em}}$
Available energy



A satellite map of North America, showing the United States, Canada, and Mexico. The map is overlaid with a grid of green lines representing state or provincial boundaries. The text is overlaid on the map, with a red-bordered box highlighting the central part of the United States.

APPLICATIONS

... monitoring drought

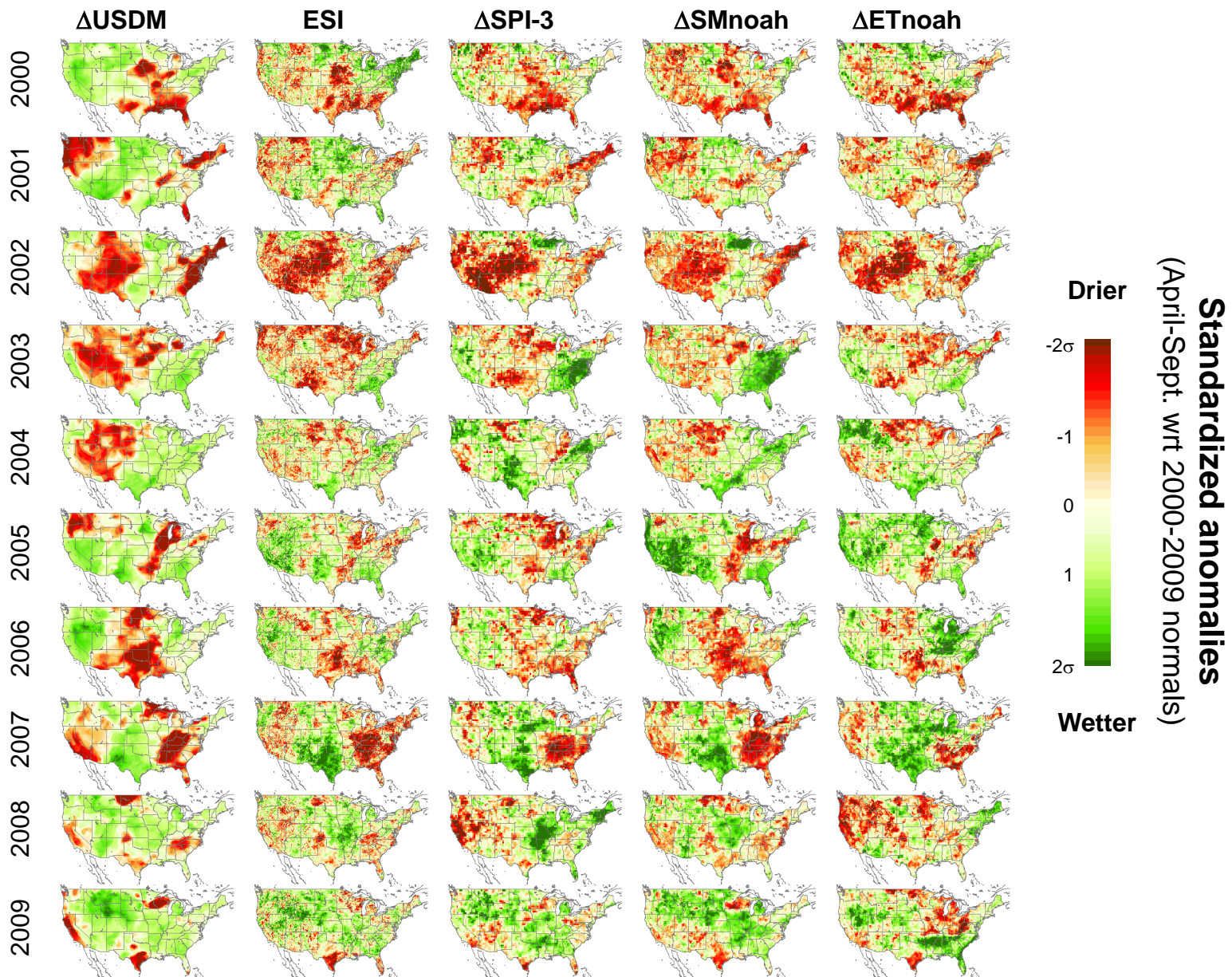
Anomalies in

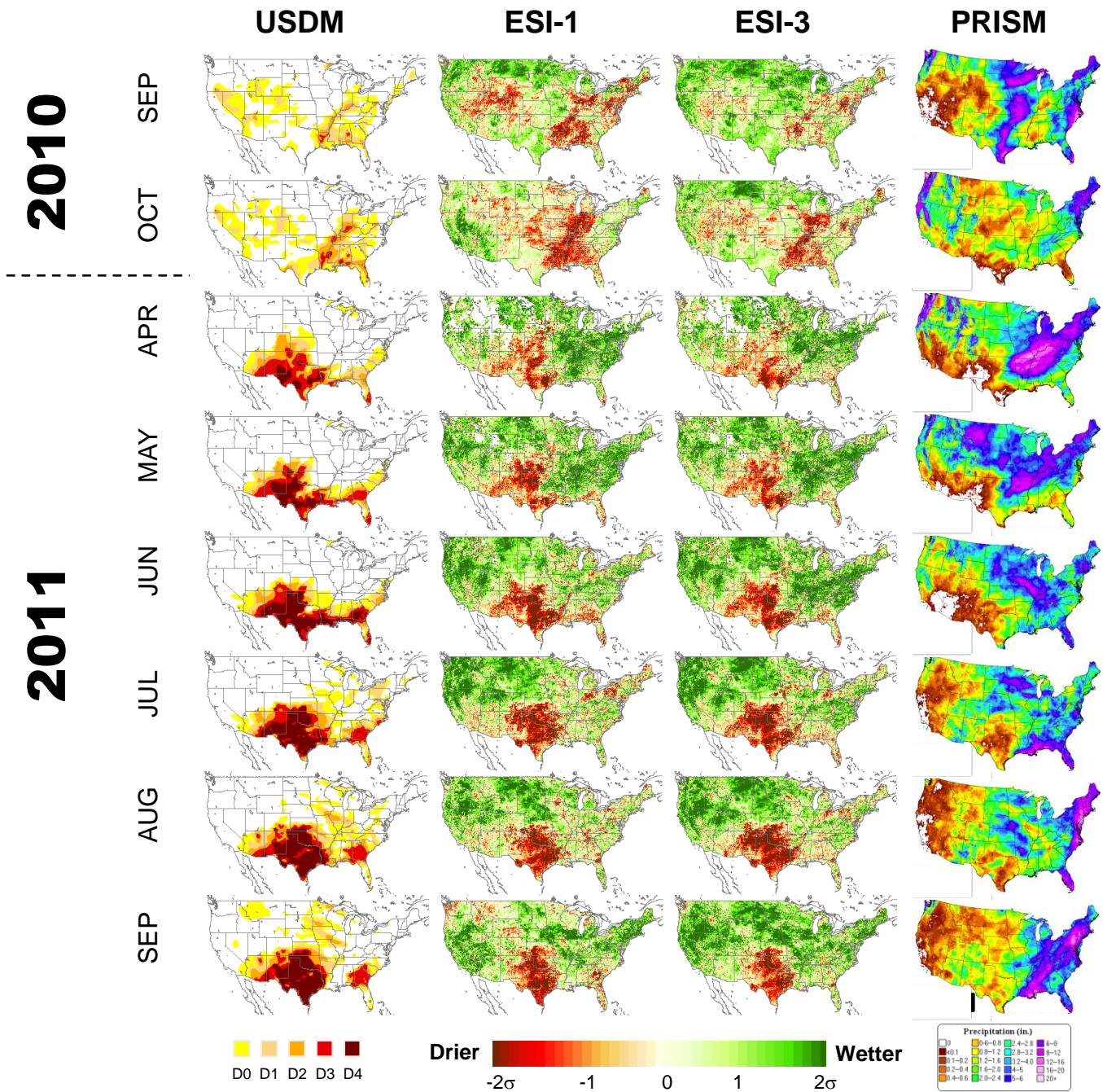
AET

PET

Evaporative Stress Index

SEASONAL ANOMALIES





Evaporative Stress Index (ESI): 2000 - Present

Product: ESI

Composite: 1 month

Year: 2011

Day of year: Day 196

LINK
☒

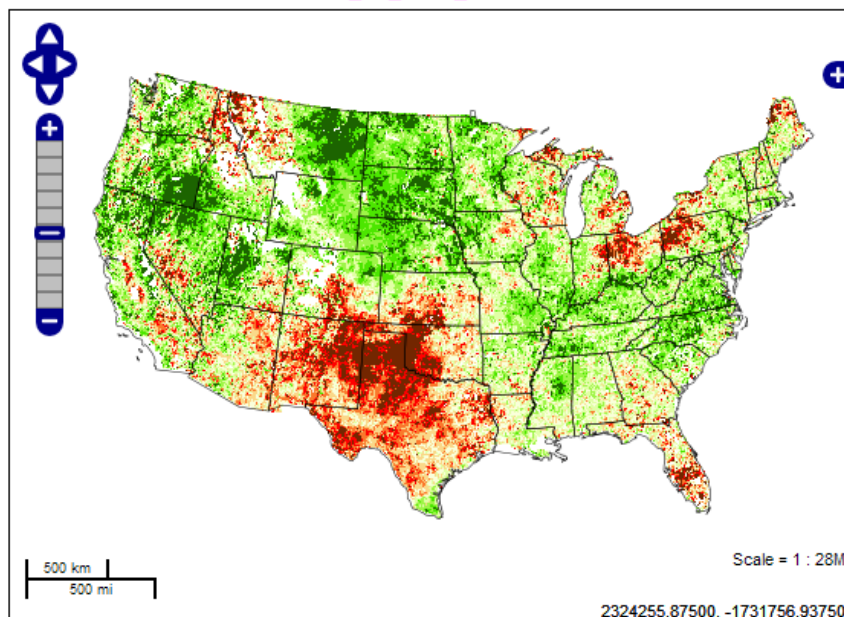
Product: DM

Composite: 0 months

Year: 2011

Day of year: Day 196

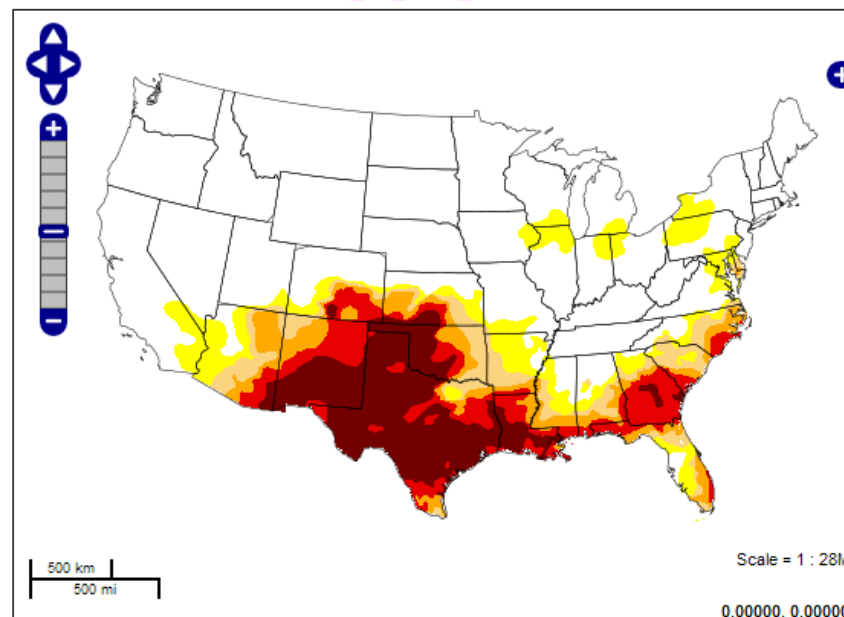
[2011/us_esi_01mn_2011196al.tif](#)



Download
Displayed Data:

Albers Conic Equal-Area projection: [geotiff](#) :: [zipped_GRID](#)
Latitude/Longitude coordinates: [geotiff](#) :: [zipped_GRID](#)

[2011/us_dm_00mn_2011196al.tif](#)



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Displayed Data:

Albers Conic Equal-Area projection: [geotiff](#) :: [zipped_GRID](#)
Latitude/Longitude coordinates: [geotiff](#) :: [zipped_GRID](#)

[Access to all data via FTP](#)

To download multiple files, point an FTP client to hrsl.arsusda.gov and use the same user ID / password.

CONCLUSIONS

- **THERMAL REMOTE SENSING DATA
HAVE GREAT UTILITY:**

- ... multi-scale ET mapping*
- ... drought monitoring*
- ... soil moisture mapping*

**COMPLEMENTS INFORMATION
FROM PRECIPITATION DATASETS**

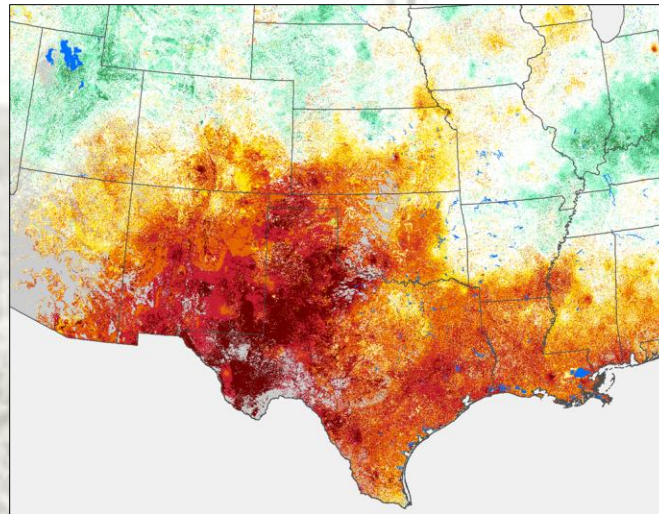
Vegetation Drought Response Index (VegDRI)

A Hybrid-based Remote Sensing Tool for Agricultural Drought Monitoring

Brian Wardlow

National Drought Mitigation Center (NDMC)

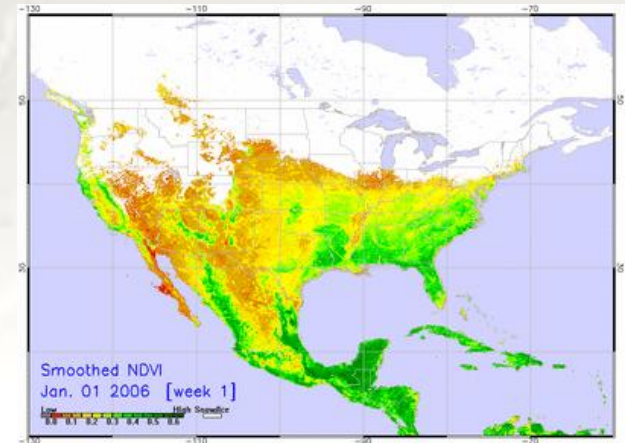
Email: bwardlow2@unl.edu



Traditional Satellite-Based Vegetation Monitoring

Many vegetation indices (VIs) have been developed to map and monitor vegetation conditions using various spectral band combinations.

- Normalized Difference Vegetation Index (NDVI)
- Enhanced Vegetation Index (EVI)
- Normalized Difference Water Index (NDWI)
- Vegetation Health Index (VHI)



Geographic patterns of seasonal vegetation greenness for the U.S. as observed from a time-series NOAA AVHRR NDVI data. (Animation produced by NOAA /NESDIS).

Advantages:

- Simple calculations
- Demonstrated relationships with biophysical characteristics of vegetation (e.g., biomass and green leaf area).

Challenges for drought monitoring:

- Discriminating drought-impacted areas from locations experiencing other types of stress (pests, disease, flooding, and fire) or land cover change.
- Classifying the different levels of drought severity (e.g., moderate, severe, and extreme).

What is VegDRI?

VegDRI is a new 'hybrid' drought index that integrates:

- satellite-based observations of vegetation conditions
- climate-based drought index data
- biophysical characteristics of the environment

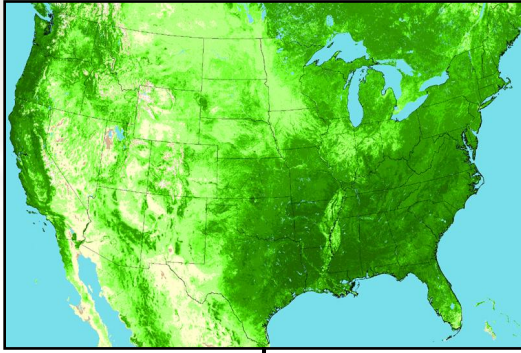
to produce 1-km spatial resolution maps that depict
'drought-related' vegetation stress.

Goals:

- 1) map county to sub-county drought patterns across the continental United States and
- 2) classify drought severity using an easily understandable classification scheme (modified Palmer Drought Severity Index, PDSI).

VegDRI – A Hybrid-Based Approach

Remote Sensing Component

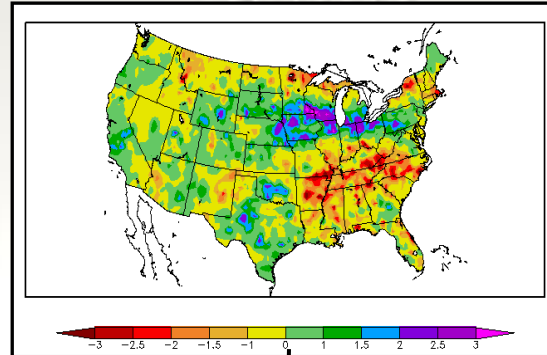


Role: Spatial detailed information about vegetation patterns and conditions acquired from satellite-based NDVI data.

Inputs:

- 1) Percent Annual Seasonal Greenness (PASG)
- 2) Start of Season Anomaly (SOSA)

Climate Component



Role: Coarser-scale geographic patterns of dryness.

Inputs:

- 1) Standardized Precipitation Index (SPI)
- 2) self-calibrated Palmer Drought Severity Index (PDSI)

Biophysical Component



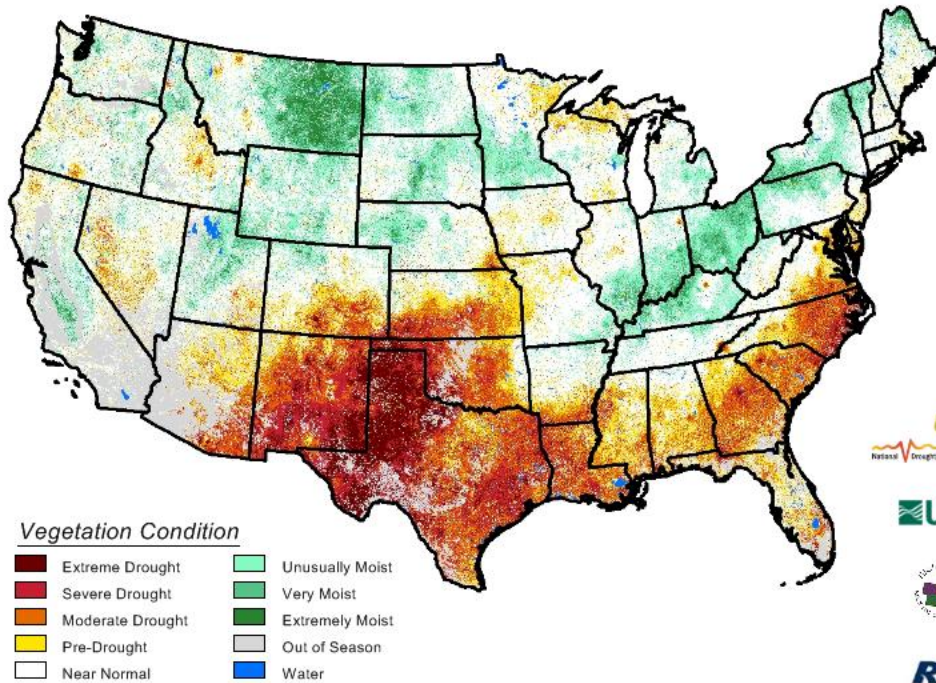
Role: Environmental characteristics that influence climate-vegetation interactions.

Inputs:

- 1) land use/cover type
- 2) soil characteristics
- 3) elevation
- 4) ecological setting
- 5) irrigated ag. land

**Vegetation Drought Response Index
Complete**

July 25, 2011



Operational VegDRI Products

- Operational production across the continental U.S. began in 2008
- Weekly and bi-weekly production of VegDRI maps
- 20+ year historical record (1989 to present) of VegDRI maps for the CONUS is available
- Suite of value-added products and data produced (customized maps, change maps and tabular data)

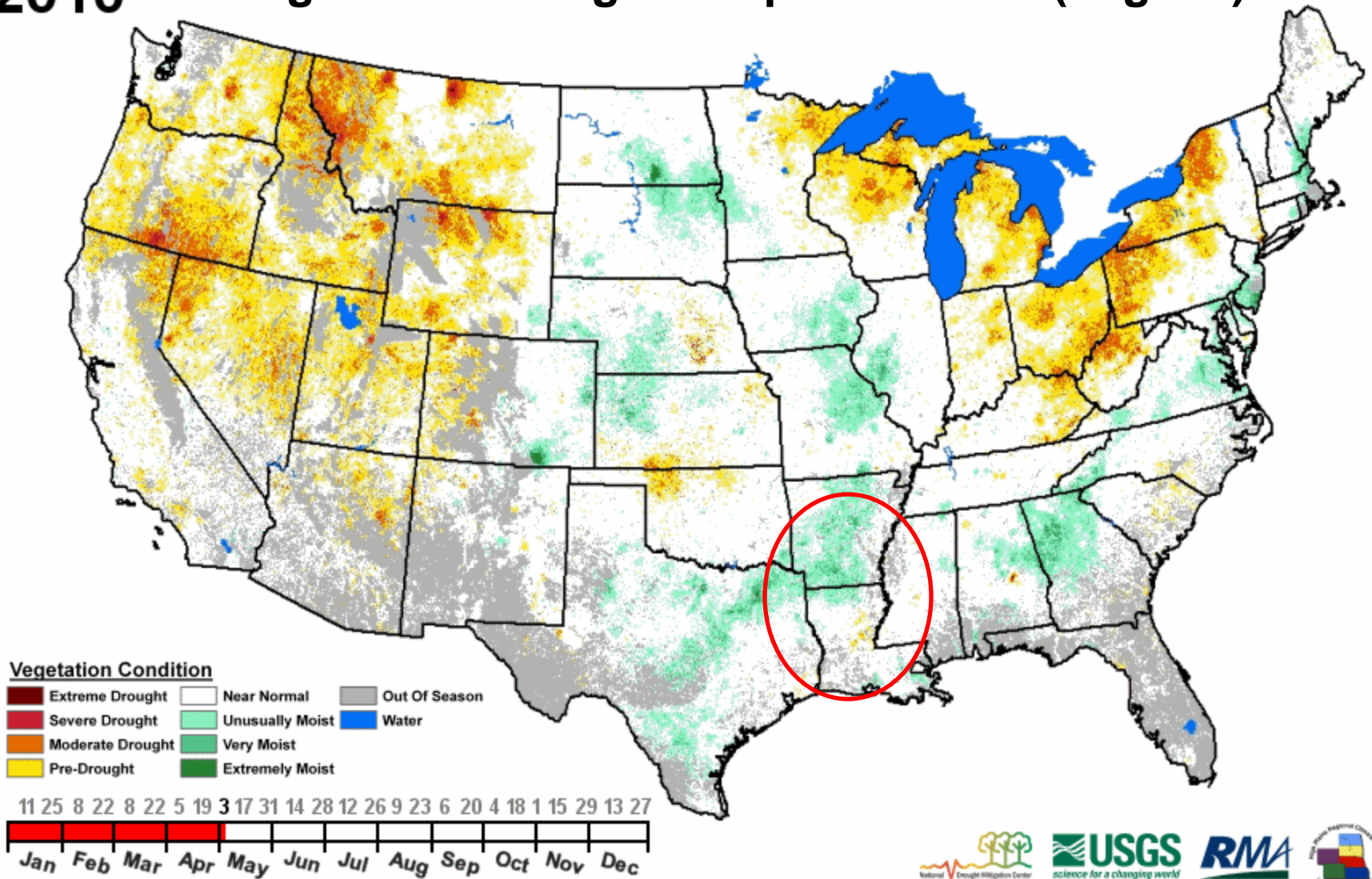
Access to VegDRI information at:

VegDRI website: http://vegдри.unl.edu/VegDRI_Main.htm

USGS Drought Viewer: <http://vegдри.cr.usgs.gov/viewer/viewer.htm>

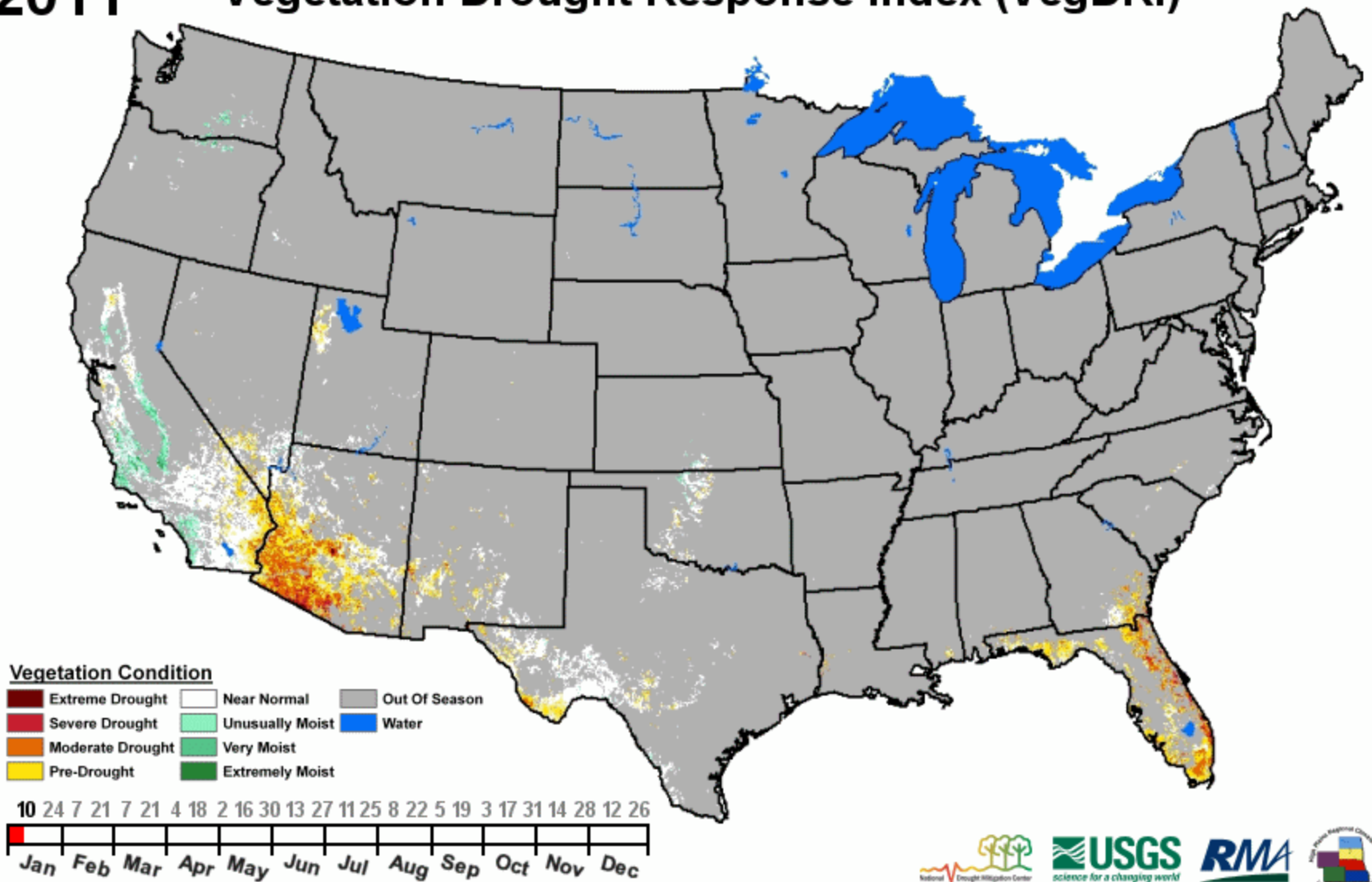
2010

Vegetation Drought Response Index (VegDRI)



2011

Vegetation Drought Response Index (VegDRI)



Examples...

U.S. Drought Monitor

March 16, 2010
Valid 7 a.m. EST

Intensity:

- D1 Abnormally Dry
- D2 Drought - Moderate
- D3 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- μ = Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Local Drought Monitor focuses on broad-scale conditions. The drought conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

Released Thursday, March 18, 2010
Author: Matthew Rosencrans, NOAA/NWS/NCEP/Climate Prediction Center

Vegetation Health

Three main messages from this month's VegDRI map: (1) most of the state is in "out of season" status, which means that either substantial amounts of the vegetation cover, such as rangelands, are dormant, or the area is snow-covered; (2) vegetation in approximately one quarter of Arizona, mostly in the southwestern part of the state, is in "near normal" status; and (3) vegetation in approximately one quarter of Arizona is exhibiting drought stress. Nevertheless, since the last state drought status report, vegetation drought stress has substantially ameliorated in those parts of the state that currently show some level of drought stress. Vegetation health for Arizona and northern Mexico, as portrayed by NOAA's Vegetation Health Index (not shown) is still at greater stress levels than this time last year, or at this time in 2005 – which was a very wet winter in at least the western half of Arizona.


January 26, 2012


Vegetation Drought Response Index Complete: Arizona

Vegetation Drought Response Index

- Severe Drought
- Moderate Drought
- Near Normal
- Unusually Moist
- Extremely Moist
- Out of Season

* VegDRI is a national product, produced by a partnership of USGS, USDA Risk Management, National Drought Mitigation Center, and the High Plains Regional Climate Center.
http://droughturl.edu/vegtri/VegDRI_State.html#AZ



[NOV 27 2010](#)


Wichita, Kansas

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CENTRAL, SOUTH CENTRAL AND SOUTHEAST KANSAS DROUGHT INFORMATION

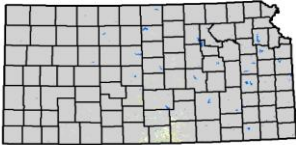
Chris Bowman - Meteorologist
National Weather Service - Wichita, KS

Vegetation Drought Response:

The following image is the Vegetation Drought Response Index (vegDRI) which is produced by the [National Drought Mitigation Center](#) with the collaboration with [Satellite \(USGS\)](#) Center for Earth Resources Observation and Science (EROS), and the High Plains Regional Climate Center and is sponsored by the US Department (USDA) Risk Management Agency (RMA). For more information regarding this product please go [here](#). The vegDRI is updated every two weeks.

Vegetation Drought Response Index


Complete: Kansas



March 8, 2010

Vegetation Condition

- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-Drought
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water



June 2009 New Mexico Drought Status Report

Vegetation Drought Response Index Complete June 1, 2009

Vegetation Condition

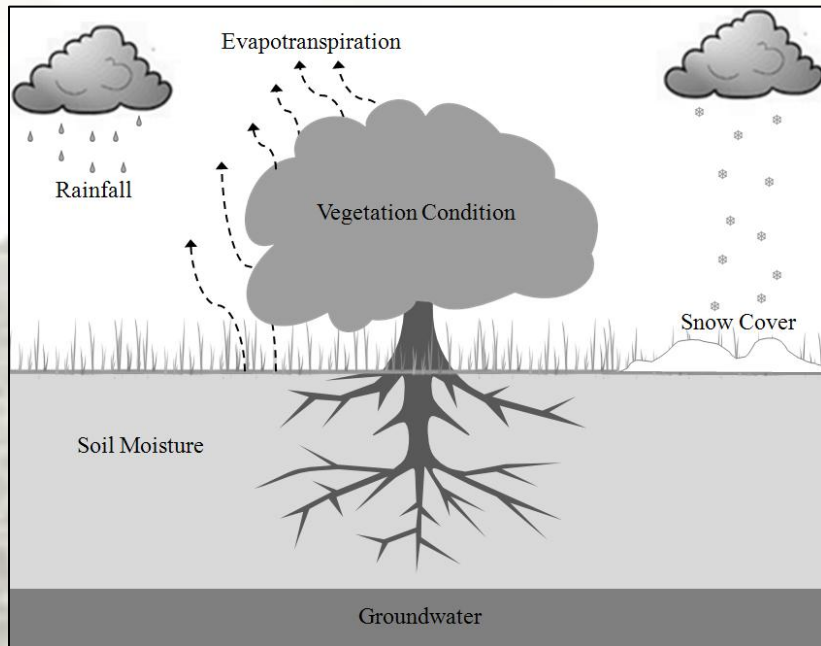
| | |
|------------------|-----------------|
| Extreme Drought | Unusually Moist |
| Severe Drought | Very Moist |
| Moderate Drought | Extremely Moist |
| Pre-Drought | Out of Season |
| Near Normal | Water |

USGS
NWS
RMA

What's Next for VegDRI?

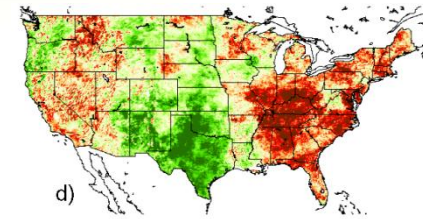
Incorporation of several new remotely sensed variables into VegDRI that impact drought-related vegetation stress to continue to improve the response time of VegDRI to shorter-term changes in drought conditions and rapid-onset events such as flash drought.

Environmental parameters monitored from satellite related to drought.

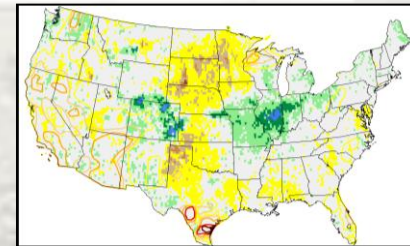


Potential New Data Inputs for VegDRI

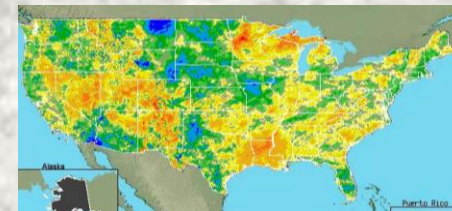
Evapotranspiration (ET)



Soil Moisture



Precipitation



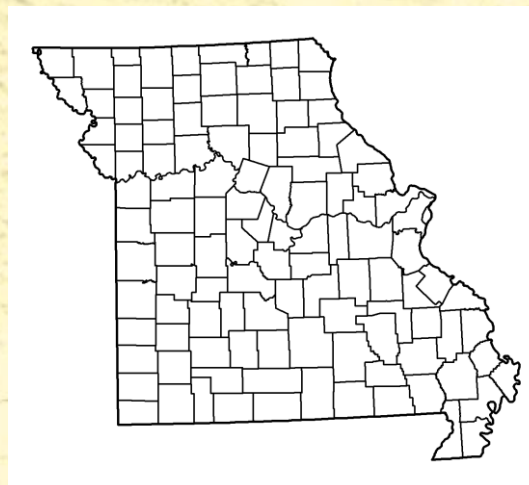
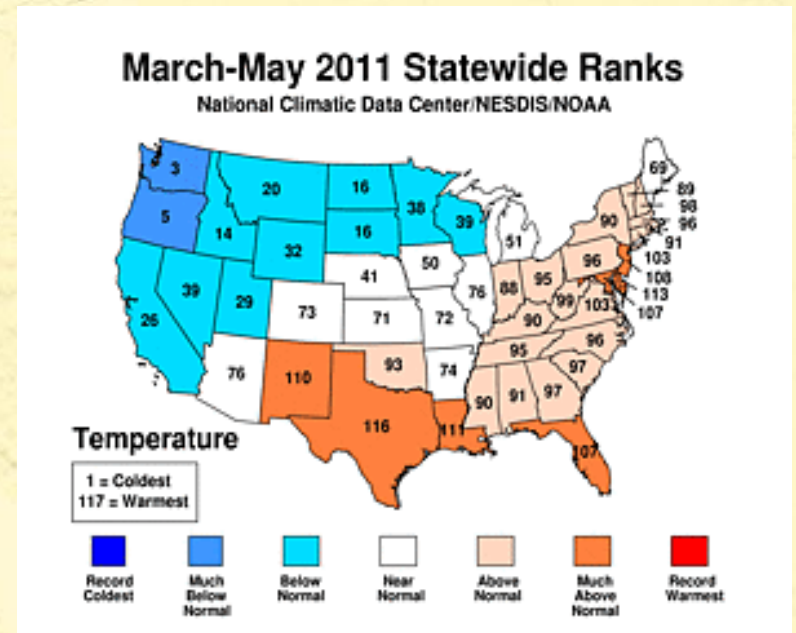
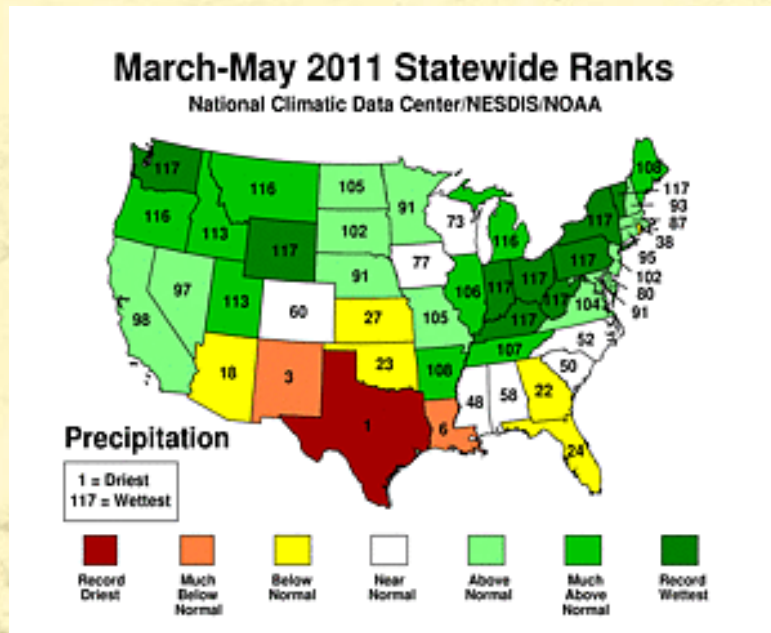
Drought Development in Missouri

Pat Guinan

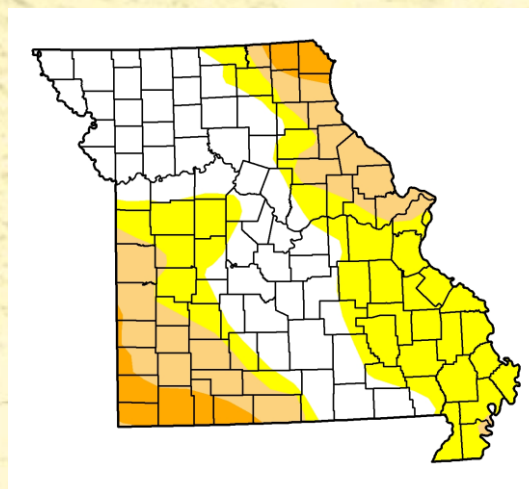
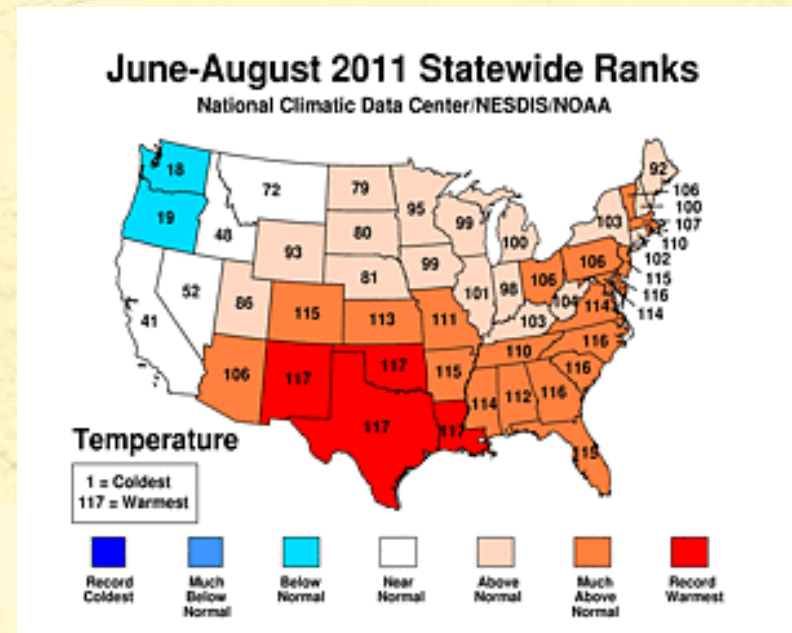
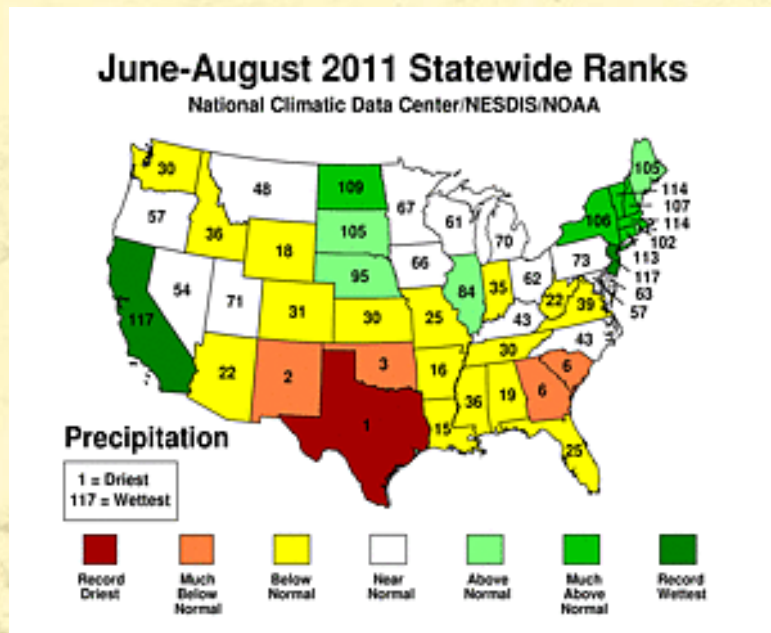
Missouri State Climatologist

Missouri Climate Center

Missouri Drought Status, May 2011



Missouri Drought Status, Aug 2011



New Mexico Update

Dave DuBois

New Mexico State Climatologist

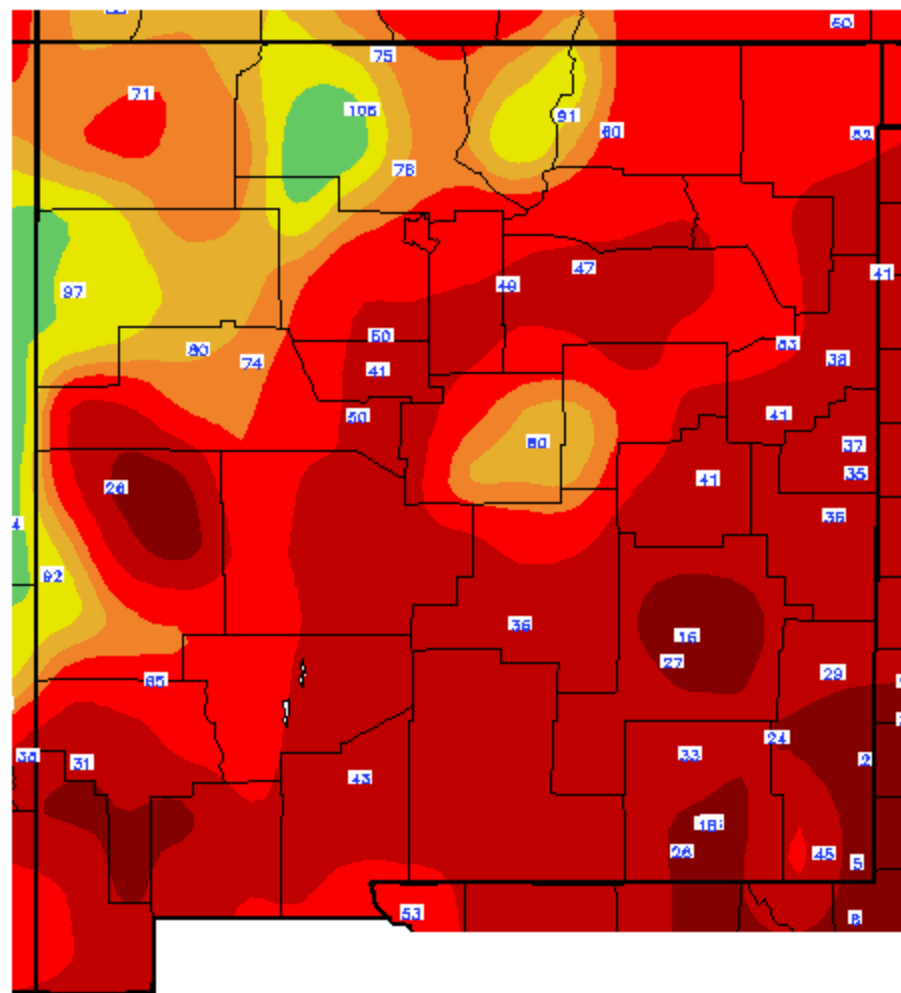
New Mexico Climate Center

Calendar Year Precipitation

Sorted by % normal, smallest to largest, below 50%

| Station | Obs (in) | Depart (in) | Pct Norm |
|-------------------------|----------|-------------|----------|
| HOBBS | 0.31 | -16.07 | 2 |
| JAL | 0.65 | -11.72 | 5 |
| BITTER LAKES WR | 2.03 | -10.42 | 16 |
| CARLSBAD CAVERN CITY AP | 2.33 | -10.39 | 18 |
| MALJAMAR | 3.38 | -11.25 | 23 |
| QUEMADO | 2.60 | -7.25 | 26 |
| CARLSBAD | 3.26 | -9.33 | 26 |
| CARLSBAD CAVERNS | 3.95 | -11.05 | 26 |
| ROSWELL IND AIR PK | 3.24 | -8.80 | 27 |
| TATUM | 4.47 | -10.82 | 29 |
| REDROCK 1 NNE | 3.66 | -8.04 | 31 |
| ARTESIA 6S | 3.78 | -8.16 | 32 |
| JORNADA EXP RANGE | 3.20 | -6.56 | 33 |
| CLOVIS | 5.86 | -10.92 | 35 |
| PORTALES | 5.51 | -10.02 | 35 |
| CAPITAN | 5.60 | -9.87 | 36 |
| CLOVIS 13 N | 6.05 | -10.25 | 37 |
| SAN JON | 6.41 | -10.36 | 38 |
| ALBUQUERQUE INTL AP | 3.35 | -4.83 | 41 |
| FT SUMNER 5 S | 5.67 | -8.17 | 41 |
| RAGLAND 3 SSW | 6.80 | -9.75 | 41 |
| OCHOA | 4.81 | -6.13 | 44 |
| LAS VEGAS MUNI AP | 7.76 | -8.85 | 47 |
| LOS LUNAS 3 SSW | 4.18 | -4.44 | 48 |
| PECOS NM | 7.59 | -7.90 | 49 |

Percent of Average Precipitation (%)
1/1/2011 – 10/24/2011



Generated 10/25/2011 at WRCC using provisional data.
NOAA Regional Climate Centers

October Precipitation

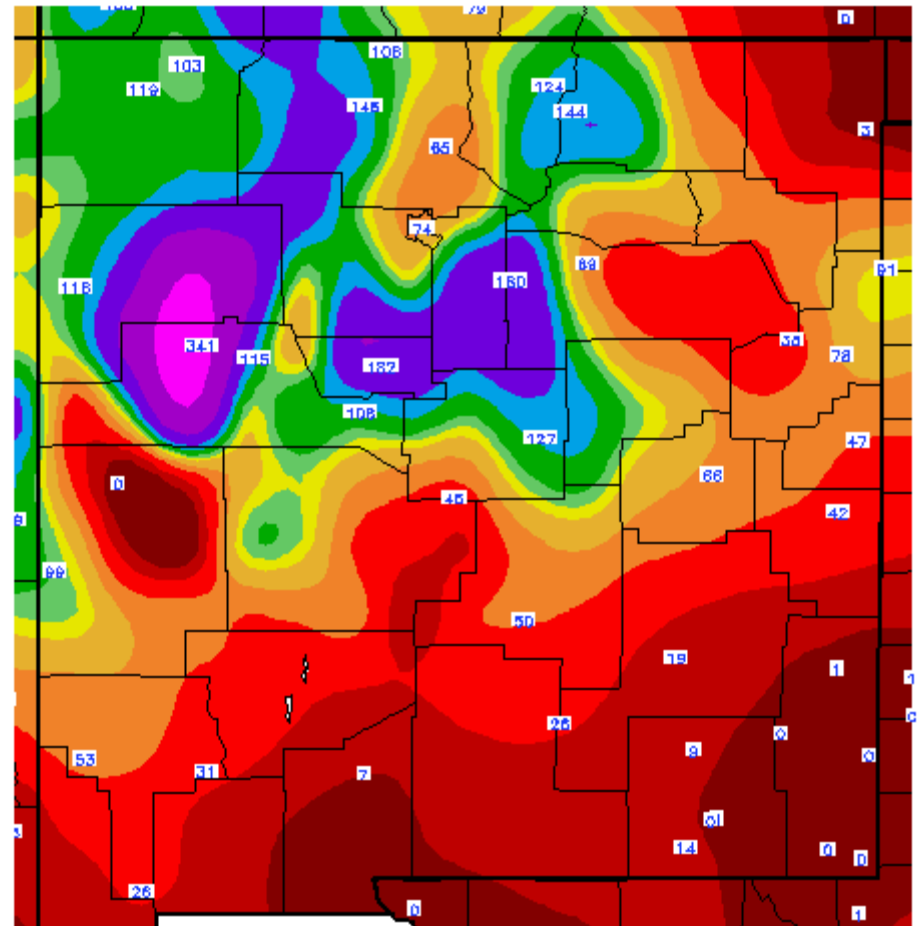
(Or start of water year)

October 1-25 departures and % of normal at driest cooperative stations

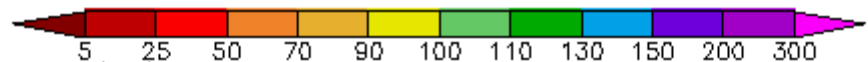
| Station | PPT (in) | Departure | % of Normal |
|-------------------------|----------|-----------|-------------|
| CARLSBAD | 0.00 | -1.19 | 0 |
| CARLSBAD CAVERN CITY AP | 0.00 | -1.03 | 0 |
| HOBBS | 0.00 | -1.27 | 0 |
| JAL | 0.00 | -1.06 | 0 |
| MALJAMAR | 0.00 | -1.05 | 0 |
| OCHOA | 0.00 | -0.90 | 0 |
| TATUM | 0.01 | -1.22 | 1 |
| CLAYTON MUNI AIR PK | 0.02 | -0.60 | 3 |
| ARTESIA 6S | 0.10 | -1.02 | 9 |
| JORNADA EXP RANGE | 0.11 | -0.83 | 12 |
| CARLSBAD CAVERNS | 0.16 | -1.00 | 14 |
| ROSWELL IND AIR PK | 0.20 | -0.91 | 18 |
| HACHITA | 0.34 | -0.59 | 37 |
| PORTALES | 0.55 | -0.80 | 41 |
| TUCUMCARI 4 NE | 0.49 | -0.71 | 41 |
| GRAN QUIVIRA NATL MO | 0.59 | -0.77 | 43 |
| CLOVIS 13 N | 0.70 | -0.84 | 45 |
| CAPITAN | 0.53 | -0.55 | 49 |

Compare with Grants >300% as it rained every day 16th to 25th.

** Snow in northern Mtns on 26th **



Percent of Average Precipitation (%)



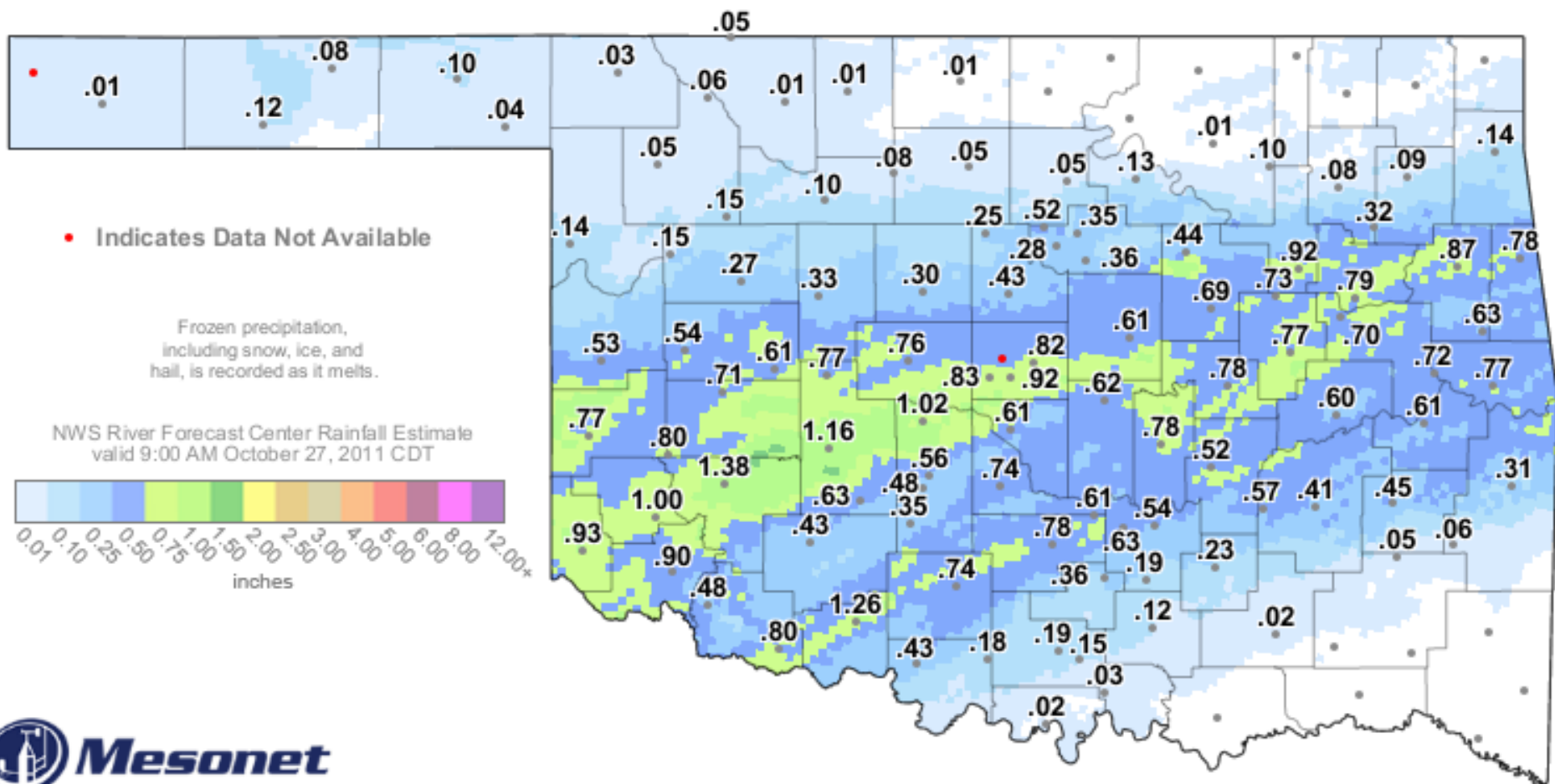
Generated 10/25/2011 at WRCC using provisional data.
NOAA Regional Climate Centers

Drought Development in Oklahoma

Gary McManus

Oklahoma Associate State Climatologist

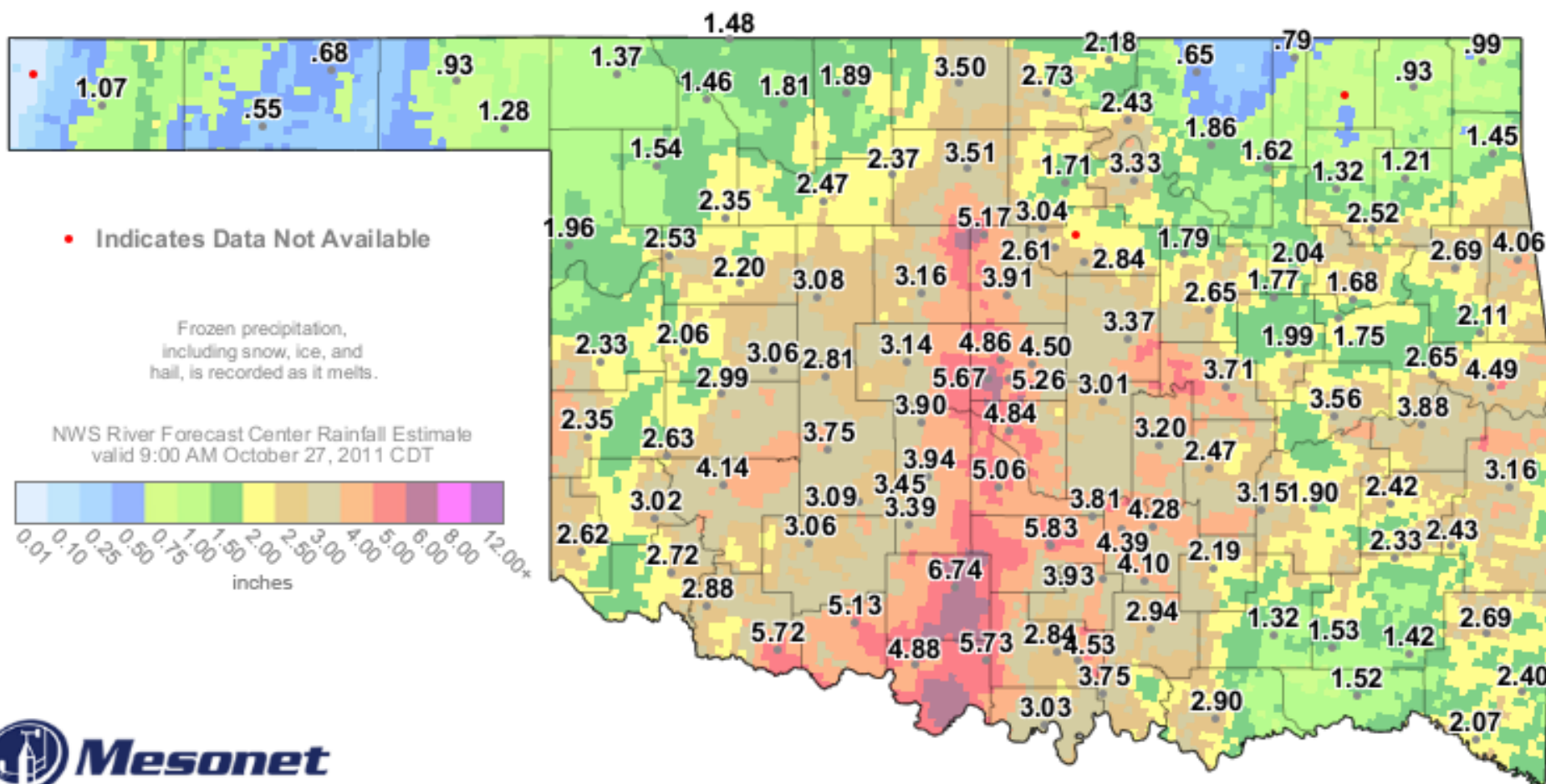
Oklahoma Climate Survey



2-Day Rainfall (inches)

9:40 AM October 27, 2011 CDT

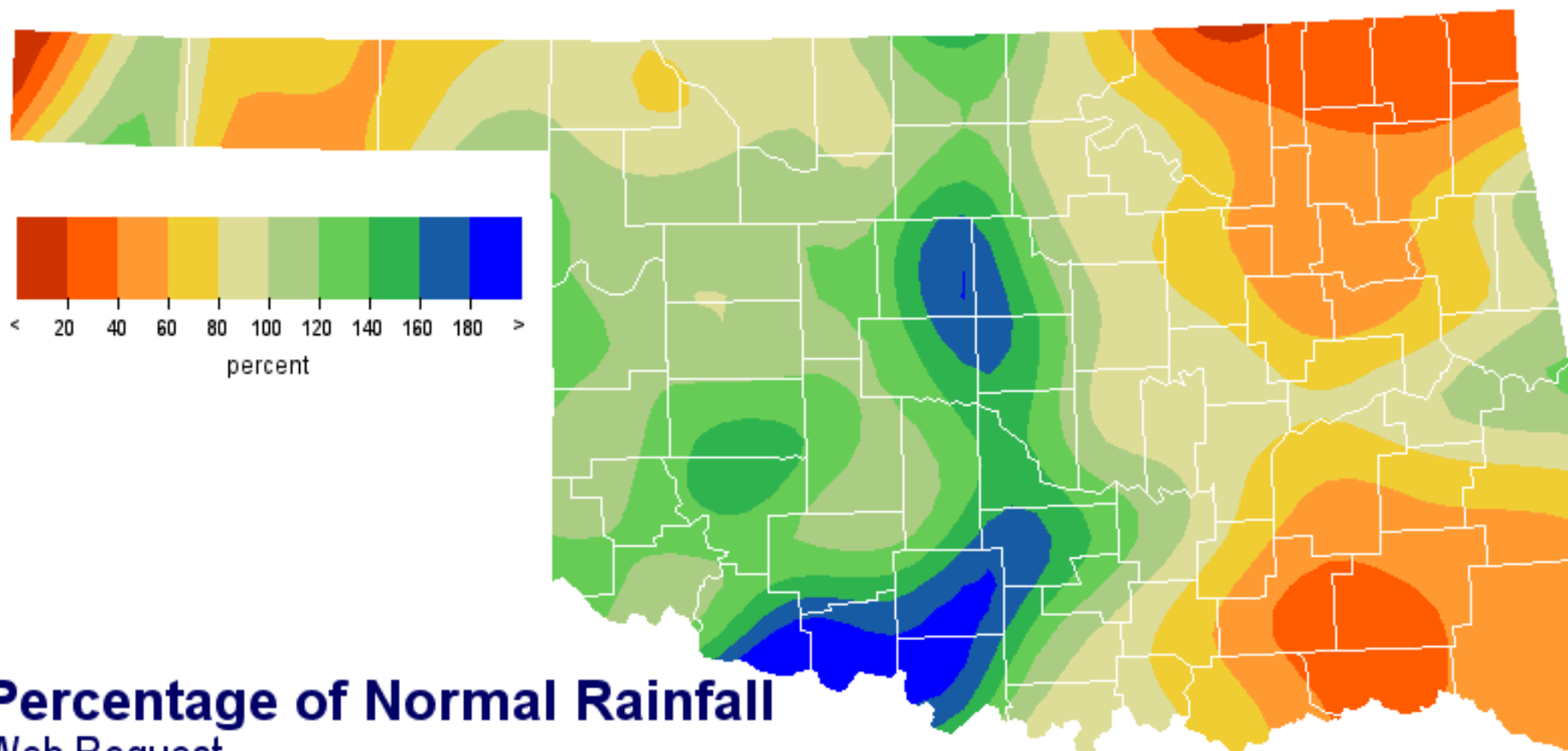
Created 9:43:58 AM October 27, 2011 CDT. © Copyright 2011



30-Day Rainfall (inches)

9:45 AM October 27, 2011 CDT

Created 9:49:04 AM October 27, 2011 CDT. © Copyright 2011



Percentage of Normal Rainfall

Web Request

Oct 1, 2011 through Oct 27, 2011

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Rainfall data collected by Oklahoma Mesonet.

OKLAHOMA
CLIMATOLOGICAL SURVEY

Image created 09:57 CDT Oct 27, 2011.

Resources

- U.S. Drought Portal
 - <http://www.drought.gov>
- Past webinars, summaries, and Federal/State Assistance
 - http://www.drought.gov/portal/server.pt/community/southern_plains
- Drought Impact Reporter
 - <http://droughtreporter.unl.edu/>
- State Climatologists
 - <http://www.stateclimate.org/>
- National Drought Mitigation Center
 - <http://drought.unl.edu/>
- Southern Climate Impacts Planning Program (SCIPP)
 - <http://www.southernclimate.org/>
- Climate Assessment for the Southwest (CLIMAS)
 - <http://www.climas.arizona.edu/>



We are now on facebook!
Southern Climate Impacts Planning Program

Is drought properly classified in your region? If not, let us know!

- Drought Impact Reporter
- Contact your State Climatologist
- E-mail the DM Authors:
droughtmonitor@unl.edu